



# American Aviation

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## Manufacturers, Airlines Go on War Basis; Civil Air Patrol Rescues Private Flying



### The Job Ahead

INEVITABLE as the war had seemed, it arrived with a breath-taking jolt. Once arrived, there could be no turning back. There can be only one objective, one determination, one victory.

A staggering burden is now placed on all branches of aviation. From production lines to fighting operations, it is the airplane upon which the nation will most rely for fighting action, for defense, for transportation, for communication. It was an airplane that loosed the first bomb in the Pacific and it will be the airplane that will be the determining factor in victory. The great challenge has now been handed to the nation which gave birth to the airplane 38 years ago this Dec. 17.

How tempting is hindsight now that war is here! The time that has been lost in preparing for the present struggle! The bungling of domestic policies which have delayed full-out production! The short-sighted actions of Congress in turning down vital defense appropriations a few years back for airways, for airports, for

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### War Department Orders Plants to Prepare For 24-Hour Shifts in Arms Production; Airlines Await Travel Restrictions

By WAYNE W. PARRISH

ALL U. S. AVIATION was quickly placed on war-time basis following the first Japanese attack on Hawaii Dec. 7.

Within 24 hours the following actions affecting aviation were taken in Washington:

Aircraft manufacturers were ordered to plan on a 24-hour day basis immediately.

All private aviation was grounded and all civil pilot licenses suspended.

Scheduled airlines were ordered not to carry any Japanese passengers and careful surveillance of all airline operations was instituted.

Sabotage orders were issued to all plants.

Creation of the long-awaited Civil Air Patrol was announced by the Office of Civilian Defense.

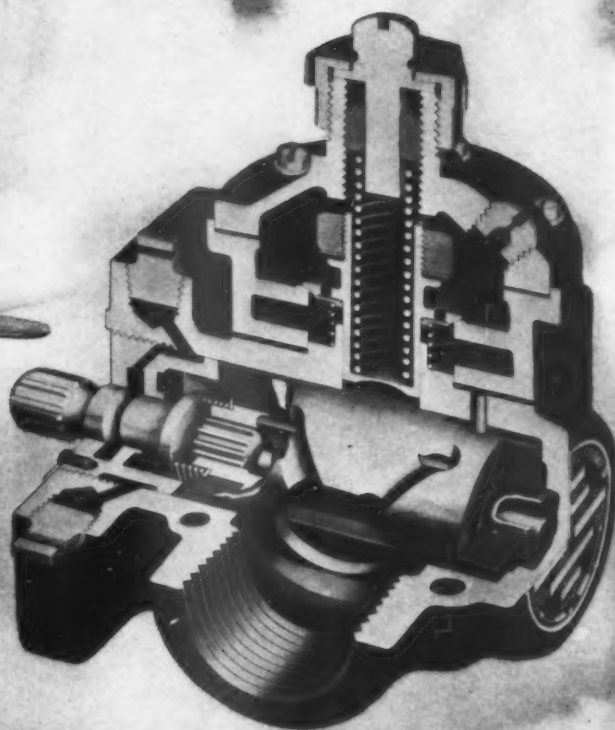
The most drastic action, that of grounding private aviation,

(Turn to page 13)

## Air Power of the Fleet



# SIMPLIFIED DESIGN FEWER PARTS LESS WEIGHT



# PESCO

# FUEL PUMPS

Long recognized as standards of reliability and performance, PESCO Aircraft Fuel Pumps offer these important advantages:

- Simplified design—no snap rings, internal screws, rivets or similar bonds.
- Fewer parts to stock for replacement.
- Required periodic overhaul accomplished more readily.
- Maintenance cost reduced.
- Unusually low power consumption.
- High suction lift.
- Comparative oscillograph analysis indicates pressure pulsation as slight as those of more complicated design.
- Splined rotor-coupling engagement insures greater dependability and longer life.

## COMPARE THESE FIGURES

PESCO Fuel Pump illustrated above compared with other makes of same output rating.

	No. of Parts*	Weight	Power Consumption
PESCO	32	3.0 lbs.	0.09 hp.
Pump A	40	3.2 lbs.	0.15 hp.
Pump B	42	3.28 lbs.	0.19 hp.
Pump C	33	3.0 lbs.	0.12 hp.

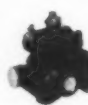
\*Excluding screws, washers and tie wires.



## STANDARD PESCO FUEL PUMPS FOR MODERN AIRCRAFT



PESCO Fuel Pump with diaphragm-type relief valve (see large illustration above).



PESCO Fuel Pump with variable displacement, designed for high altitude flying.



PESCO Fuel Pump with relief valve in line and standard side ports.



PESCO Standard Pump for fuel transfer. Usually motor driven.



PESCO Fuel Pump with end ports for special space requirements.



PESCO Low Capacity Fuel Pump specially designed for smaller planes.

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# War Focuses Interest on U. S. Air Power

## Gen. Arnold Sees Military Aviation as of Supreme Importance; Discloses Air Lessons Learned from Abroad

WHILE the true condition of present U. S. Army air power can only be revealed through the trials of actual combat, Maj. Gen. H. H. Arnold, chief of the Army Air Forces, has disclosed important concepts which are expected to guide the immediate expansion of U. S. Air Forces and their employment in battle.

Looking at the past to anticipate the future military role of aviation, Gen. Arnold, shortly before the outbreak of hostilities with Japan, declared without qualification that "air power is a factor of utmost importance, at times of supreme importance in war—any kind of war."

Clearly and precisely, Gen. Arnold told a group of West Point officers and cadets that land and sea operations cannot succeed when the enemy has control of the air.

### Air Power Superior

Where air power and naval power have come into conflict in the European war, there has not been a single instance, he said, where naval power has prevailed over air power, whereas the invasion of Norway, the sinking of the Bismarck, the invasion of Crete and other engagements have provided examples of air power prevailing over naval power.

Sea power, he pointed out, may no longer be considered synonymous with naval power, but sea power is a combination of air and naval power, a fact never more clearly recognized than it is today.

Exploding a belief given impetus by early Nazi tactics, Gen. Arnold asserted that to gain control of the air, the enemy's aircraft are best destroyed when actually in flight or in the factory, rather than on their airbases. The present war has shown that it is too easy to disperse or conceal aircraft on the ground and protect them with individual parapets so that losses will not be severe.

### Air Strategy

Strongly emphasized as an "essential principle of air strategy" was the belief that the full weight of air power must be available either for purely air operations or for the support of the naval or land operations, whichever may be of decisive importance at the time. Stated otherwise, air units needed for direct and close functioning with Army and Navy forces should be under the command of those forces, to achieve the concentration of maximum force at the decisive time and place.

Other significant conclusions drawn by Gen. Arnold from progress of the war abroad are these: The single-engine fighter, with

its superior maneuverability, appears to hold the edge over other fighter types. It should have every ounce of firepower it can carry without impairing required performance. While during the day the fighter is more than a match for bombers, it must push up its ceiling above 40,000 feet if it is to maintain this supremacy.

Fighters can prevent the loss of a war, but the heavy bombers are required to win it. The backbone of air power is the heavy bomber, in production of which the U. S. leads the world by several laps. However, since pursuits can conquer present bombers by day and since indiscriminate night bombing cannot in itself prove decisive, the

units, and it must be supported by a huge organized force of trained civilian volunteers.

Regarding the numerical strength of the Army Air Forces, Gen. Arnold disclosed that last October it possessed more than 2,500 combat planes, compared to 1,000 at the beginning of the emergency, the gain accruing despite "heavy diversion of planes abroad." About 800 warplanes were described as ready for action at the Army's overseas bases.

Detailing progress made in developing air power over the past two years, the Air Forces chief stressed improvements in the effectiveness of types.

"No one denies," Gen. Arnold said, "that we were short on types with which to go into mass production when war broke out. In pursuit, we had an experimental order for 13 Curtiss P-40's, a first class fighter; however, most of our squadrons were flying obsolescent types

the way out. They lack the necessary sting."

Hundreds of P-40's, it was pointed out, have been built and delivered to U. S. squadrons and to the British, who have found them superior to the Hurricane. Although they have been adopted as standard equipment in the Near East, "we no longer rate the P-40 as better than a good pursuit trainer, because of its limitations in speed, ceiling and firepower."

On the basis of British experiences with the B-17 flying fortress, the ceiling of that model has been increased from 25,000 to 34,000 feet which has enabled the RAF to make successful day and night raids over Germany "with virtual immunity from enemy fighters and ground fire," Gen. Arnold asserted.

Aside from these two combat models, Gen. Arnold explained, "we had to embark on an extensive and hazardous program of buying airplanes on paper, without the usual



Hundreds of Trainers for Air Corps Cadets

U. S. must build even faster bombers with higher ceilings and stronger defensive armament.

Dive bombers can achieve devastating results, although their use is often accompanied by heavy losses as compared with the horizontal bombing heretofore stressed by the Army Air Forces. The Douglas A-24 dive bombers with which U. S. squadrons are now being equipped will out-perform those of any foreign country.

Parachute troops and air-borne infantry can be highly effective. The Crete incident has proved the value of glider-borne troops, and the U. S. Army is keeping abreast of this development by procurement of gliders and the training of selected pilots in motorless flight.

An aircraft warning net is indispensable to the organization of defensive fighters and anti-aircraft

whose firepower of one .30 and one .50 caliber machine gun each was a pin-prick. In bombardment, we had the first models of what has since proved to be the most outstanding bomber in the world—the B-17. Today, England and other countries are pleading with ever increasing fervor for any of that type they can get, from one up to 1,000. But we had only 13 of them.

"Modifications were necessary in the P-40, and we have been incorporating them into our later pursuit models—armor plate, leak-proof tanks, more rugged landing gear for unprepared fields, and, especially—greater firepower. The British like eight or more machine guns, preferably of unmixed caliber . . . all .50 calibers or all cannon rather than, say, a combination of .50's and .30's. In fact the .30 caliber machine guns for fighters are on

service testing. Bugs cropped up in the new ships, but such difficulties are not going to stop us from procuring in ever increasing quantity the best fighting airplanes in existence.

"In the pursuit category, we have reached the large production stage on our single-engined Bell-39, a type that has demonstrated it is a match for the Spitfire and Messerschmitt up to 16,000 feet, and on our Lockheed P-38. Eclipsing both of these, however, is the new single-engine Republic P-47B. In various stages of development are pursuit types which will make all current types look obsolete.

"The Douglas A-20 series, a splendid light bomber and night fighter, has been rolling off the assembly lines in shoals, and so has the Martin B-26, a medium bomber of out-

(Turn to page 10)

## Air Scoops

Freedom for Expansion . . . Air Corp Training . . . Mail Profit  
Capital Whispers . . . Small Firms Protest

### Airline Expansion

For several months up to the Jap attack on Hawaii, talk was thick in domestic air transport circles of possible expansion, both for temporary war purposes and for post-war commercial development, into far-away points such as Europe, South America and Alaska. Some of this talk had been translated into applications to Alaskan and Central American points and even to Newfoundland. One big reason is the development of long-range transport planes and possibilities of using this equipment in peace times . . . There has been some serious talk of contracting for the Army at any point in the world the Army chooses . . . Some top airline executives believe post-war aviation developments will see many of the restrictions of "franchises" removed in favor of a "freedom of the air" policy similar to that of the "freedom of the sea" tradition. What the Jap war will do to this thinking is not clear but it seems certain that some plans that were talked of a few weeks ago will probably go by the boards for the time being . . . This, however, will not likely affect one or two large-scale plans now in the wind.

### Material Substitutions

Navy officials reveal that cotton has replaced linen webbing in parachute harnesses, synthetic rubber is being substituted for real rubber in various aviation uses, synthetic rather than imported silk can be used in parachutes, but the so-called "plastics" still can't be authorized for other than non-structural components. "The Bureau of Aeronautics has not yet found structural materials which can be used under production conditions as general substitutes for the highly satisfactory high-strength aluminum alloys . . .", Adm. Towers told Congress.

### Full Speed on Army Training

More (and drastic) action can be expected on pilot training for the Army. Cadet quotas haven't been met for some time but further relaxing of entrance requirements will probably meet the deficiencies . . . And in another direction, more attention will be given to training pilots for multi-engined equipment. This has been the weakest spot in the entire Army training program and more than one airline is being brought into the picture on a contract basis . . . Still another weakness is destined to be remedied

shortly—in training maintenance mechanics. While there have been plenty of mechanics available up to now, the training facilities of private schools must be used to capacity to meet the needs of six months and one year hence . . . The Pacific war will speed up all training and would have been much further along had the Army obtained the training funds it asked for several years ago. The faces of some Congressmen who voted against defense funds during the past three years are reported to be very red.

### Federal Profit from Airmail

When official Post Office figures are released they will show that 25% more air mail was carried in fiscal 1941 than in 1940. Official report is expected to reveal that revenues to the P. O. exceeded payments to the carriers by a substantial margin. The exact amount cannot now be ascertained because of pending CAB air mail rate decisions.

### Pots and Pans

Suggested reading for those who may be worried about the U. S. aluminum shortage is Aluminum Union Ltd.'s full page advertisement in the October *Aeronautics*, British aviation journal, offering for sale a complete line of "office furniture in aluminum." The company describes itself as the "largest distributor in the British Empire of aluminum and its alloys in all commercial forms." The desk pictured in the ad is especially nice looking.

### Chamber Endorsement

The aircraft manufacturing industry is heartily pleased at Col. John H. Jouett's administration of the Aeronautical Chamber of Commerce, the industry's trade association, and his re-election recently was merely a formality. The meeting also gave a pat on the back to Irving Taylor, manager of the Chamber's trade development, in recognition of his effort the past year.

Only major issue at stake is the extent to which the Chamber should engage in public relations activities and this question is to be settled (or at least recommendations are to be made) by a top-flight committee of the following: Raycroft Walsh, vice-president of United Aircraft Corp.; J. A. B. Smith, vice-president of Curtiss-Wright Corp.; Charles Marcus, vice-president of Bendix Avia-

tion Corp.; H. E. Weihmiller, vice-president of Consolidated Aircraft Corp., and A. T. Burton, Washington representative of North American Aviation Inc. Howard Mingos, who has been a vice-president of the Chamber for several years in charge of public relations, was also re-elected by an overwhelming voice vote.

### Heard in Washington

Canada may soon undertake construction of the British Westland Whirlwind, high-speed twin-engined fighter of plywood, powered by Rolls Royce Merlin . . . Part of the Army's new standard equipment in heavy advanced trainers is a power gun turret costing \$18,750 and a bombsight costing \$8,500 . . . The Navy is seeking to freeze its torpedo plane type to be on the line soon . . . OPM has told the Services they must give plane makers 18 months' notice of all forthcoming orders so materials may be scheduled . . . A few days before the Japs swooped on Hawaii the OPM Aircraft Branch's civil aircraft committee recommended construction clearance for 19 more DC-4s in the 18 months from Jan. 1, which would raise the quota for that model to 39. SPAB must act on the recommendation, however. Pan American would probably stand to gain more.

### Clamor for Contracts

Small business will descend like an avalanche on Congress in the next few months when material shortages become far more severe and when the OPM, War and Navy divisions of contract distribution have failed to dish out much relief through small orders because small business is not equipped to handle defense work. When the boys back home start crying louder, the boys on the Hill are apt to act rashly.

Already there are definite indications that members of Congress may attempt to force aircraft and other prime contractors to increase their subcontracting for political reasons, no matter how impractical it may be. There is much talk of endowing Floyd Odlum with legal authority to dictate who should farm out orders and to whom. Also there is talk of legally requiring that defense work be placed in distress areas, of providing rigorous penalty against prime contractors who fail to meet delivery dates as an indirect encouragement of subcontracting.



# The Birdmen's Perch

We've come to the conclusion that our public can't take it. First they were clamoring for really tough problems. So we ran them. Then what happens? The fellows who had been doing most of the yelling fold up and silently steal away. Only a few hardy souls, such as the fellow below, can answer those stickers. Shall we go back to diaper-days problems, boys?

Major Al Williams, alias, "Tattered Wing Tips,"  
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

## WOONG THE MUSE DEPT.



There's something about a plane that moves more people to poetry! Here's the latest to reach our desk. It's from Miss Bonnie Walters of Omaha, Nebraska.

The plane in the hangar stretched its wings,  
And gave a mighty yawn,  
He thought as he wriggled his piston rings,  
My, what a beautiful dawn!

He partook of his breakfast of gasoline,  
And out on the runway he rolled,  
Then, glancing to see if his face was clean,  
Up into the air he strolled.

He impolitely scared a tree,  
By zooming far too low,  
Then looking up, what did he see?  
It brought him grief and woe.

For soaring high above him,  
He saw his girl friend, Jane,  
She was acting coy with Tailspin Jim,  
Oh, it gave him a pain.

So up he went with a mighty roar,  
And knocked Jim in a spin,  
He watched him hit the floor  
And then, took Jane back down with him.

Jane thought that he was wonderful,  
And softly rubbed wing tips,  
She praised him till the little plane's heart,  
Was doing backward flips.

The little plane was very gay,  
His head was in a cloud,  
Then he and Jane went off to play.  
They both were very proud.

## THIS MONTH'S BRAIN TWISTER

Robert Smith, of Hamilton, Ontario, is one of the fellows who thinks our "tough" prob-

lems are just sissies. So he sends in one of his own. What can you do with it?

A flying hunter took off and started to fly due South. After he had traveled 100 miles he had seen nothing, so he turned and flew due East. At the end of 100 miles he spotted a bear on the ground so he landed and shot it. He then took off again and flew 100 miles back home. What was the color of the bear? (Ouch!)

## IT PAYS TO BE CRITICAL

A great author once remarked that good literature often depended upon a man's ability to cut his own writing ruthlessly. The man, who could go through his own brain child, remove every extraneous word—*he* would have something worthwhile when he got through!

We use the same system in producing Gulfpride Motor Oil. We are constantly



critical of this oil. We are never satisfied with removing just enough impurities from it. We go even further and by a special process of refining—the Alchlor Process—we remove *more* of the carbon and sludge-formers that often can be so costly to an airplane engine. We think the success of Gulfpride Motor Oil proves that it pays to be mighty critical—especially of your own products!

## WHOPPER OF THE MONTH

Dear Major,  
I operate a loop-o-plane in a carnival. Maybe you've seen a Loop-o-plane. They're little four-seated buckets that whirl around on a pole. A motor revolves the pole.

Well, one day I was cleaning up the motor, waiting for the evening trade to start, when quite by chance I spilled a little G.A.G. on



the motor—you'll notice I said *on* the motor. Just then a customer appears so I hop down and sell him a ride. Well, I no sooner touch that switch and turn my back than the danged thing whirls around twice and shoots the car up to substratosphere levels. After it circles it heads west at four hundred m.p.h. and disappears. Not having heard of a preceding similar situation, I set down to think and darned if after half an hour it doesn't zoom over the roller coaster and make the prettiest hook-on landing on its whirligig.

After the passenger recovered he filed suit for twenty grand, which just cleaned out my Irish sweepstake winnings. I was going to sue G.A.G. for underrating their products but I got a ten-year mail contract flying round trips to Mandalay.

Hey, this straight-jacket doesn't fit!

Sincerely yours,

R. M. R.



Gulf Oil Corporation and Gulf Refining Company . . . makers of





## *from the Employees of Lockheed — Christmas 1941*

The American Aircraft Industry produced a lot of airplanes at an ever-increasing tempo during the first nine months of 1941. It actually expanded 900% over the same period a year ago. The count isn't in for the whole year yet, but our pace—our output—continues to forge ahead.

*There's one real reason for this record—and that's because our hearts are in our jobs . . . but we're not different from any other men in American industry.*

We do think however, Americans everywhere should know these aviation facts:

1. No industry in the history of the world has expanded so fast—EVER.
2. No industry has ever expanded so—with NO sacrifice of quality in product.
3. No industry has EVER so led the world in performance, stamina, speed, of product.
4. No country—England, Germany—any country—produces better airplanes of any type—big bombers—medium or light or dive bombers—interceptors or pursuits.



These are strong statements. But we can make them honestly, without boasting; it's been a cooperative job. We've had to make changes and we've learned a lot. We've worked with Washington and Dayton—with OPM—the engine men—with the Army and the Navy. We've fought with

them too—but that's the healthy, democratic way of getting the best from the best country in the world. But mind you we've fought *with*—NOT *against* them, and they with us, *not* against us. Without them we would have accomplished little.

Now, the gearing up—the speeding up—is well on its way. Now—REAL production is rolling. Now 'planes to turn the tide are being delivered in fast-increasing quantities.

And from it all we are learning so much that it seems almost unbelievable. Military necessity has taught us new wing structures—new aerodynamics that doubtless will be applied to the design of post-war airplanes for you—for the world. And military production techniques are teaching us how to make them cheaper—faster—stronger.

That's why we know that permanent good is coming from this emergency. That's why our jobs are good jobs. That's why we anticipate a future of peace on earth—a future industry that will make your lives—our lives—more prosperous and happy.

LOCKHEED AIRCRAFT CORPORATION • BURBANK CALIFORNIA



# Aviation Items Prominent in War Measures

## House Awaits New Request; Senate Rushes Last 'Defense' Bill

By CELESTE W. PAGE

WHILE the House awaited a vast new request for appropriations to equip the Army and Navy for active warfare, the Senate speeded passage of the last "defense" appropriation, an eight-billion-dollar bill carrying \$779,000,000 for the Army Air Corps and \$449,720,000 for the Navy Bureau of Aeronautics.

The items in this bill are of particular interest now as a guide to the far-sighted policy of preparedness of our air forces, since the estimates were submitted to Congress before this country had any conception of the Japanese plans to practice the most exquisite refinement in treachery ever known to modern civilization.

### More Spare Parts

The War Department appropriation, for example, contains, besides a deficiency item of \$331,763,000 to cover increased costs of some 16,000 aircraft under contract, an even larger sum—\$408,488,000—to raise from 12½ to 20 per cent the spare part equipment of all combat planes.

With a similarly bold forward stroke, the Army sought and received \$379,804,238 to construct 11 new airfields including four at unnamed locations outside the continental U. S. and 14 "skeletonized" fields complete except for housing and technical facilities and located half in the U. S., half outside the continental limits.

Other Air Corps installations will also be put into rapid construction with money furnished in this measure, including a \$9,261,336 expansion of the Wright Field laboratory; improvement of air depots at Rome, N. Y., Oklahoma City, and Wellston, Ga.; and \$15,000,000 to complete construction incident to the 30,000-pilot training program.

Ironically, the bill also contemplates \$20,249,698 for additional military aviation facilities in the Hawaiian Department and \$3,222,911 for bombing and aerial gunnery practice facilities on Matagorda Island and the Matagorda Peninsula.

### Rapid Growth Now

Size of the Army Air Forces will be built up—now as rapidly as possible in light of Dec. 7—to 84-group strength and may be further augmented with forthcoming new requests to Congress. Even before war was declared this regular Army aviation personnel was scheduled for support by the creation of 21,119 additional aviation cadets to be commissioned as second lieutenants in the Air Reserve.

It was Admiral Towers, chief of the Navy Bureau of Aeronautics, who hinted indirectly at the actual realization of naval air operations

even before the Japanese invasion when he told a House committee in secret session during hearings on this bill that new aircraft—2020 planes complete with spare parts and "more effective" ordnance installation—were immediately necessary to provide advanced training of Navy pilots in service types.

"Operating requirements" of the Naval air force, he said, made it impossible for service squadrons to conduct this training "to the extent possible in normal times." Presumably the Admiral had reference to naval aircraft activity in the Atlantic as well as Pacific patrols.

Besides these funds for Army and Navy aviation, the same measure contains a number of other aeronautical appropriations including over \$50,000,000 for expansion of CAA's airport development program.

This item came upon a stroke of misfortune in the House Appropriations Committee where several political-minded members, notably Reps. Johnson of West Virginia, Johnson of Oklahoma, and Lambertson of Kansas, were instrumental at first in effecting a \$7,865,300 cut in the vitally urgent airport appropriations apparently, judging from the transcript of their remarks in committee, for the old pork-barrel argument that not enough of this program is being dished out for their home town locations.

Rep. Johnson of West Virginia, for example, asked Col. Clay, of the Airport Approval Committee, if he did not know that "West Virginia is still in the union." Col. Clay had just explained most painstakingly that military strategy alone was of necessity the sole governing consideration in the location of CAA landing field improvements.

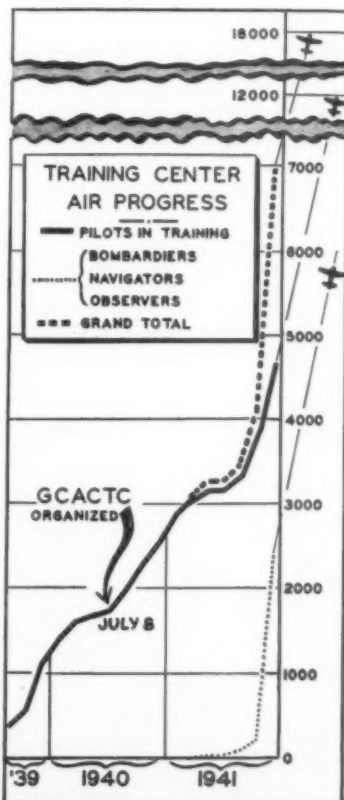
The House also cut in half to \$5,000,000 a fund for construction of flight strips along defense highways, a project strongly recommended by officials of the Army Air Forces.

### Weather Air Aids

Other appropriations in the same bill for aviation included a \$190,000 item for additional Weather Bureau aids to air navigation, \$365,000 for NLRB elections in defense industries, \$10,000,000 for temporary defense housing near aircraft and other war industries, \$75,000 for the Labor Department's Division of Public Contracts for "policing of defense contracts," \$171,500 for air and ocean navigation maps and charts by the Coast and Geodetic Survey, and large additional amounts for development of power facilities and access roads to service establishments and armament factories.

The Post Office Department received \$20,629 for extension of Continental Air Lines' Route 43 from Pueblo to Tulsa via Wichita.

## Air Corps Gulf Coast Area Reports Record 6,992 Students in Training



REFLECTING the rapid expansion made by the Air Corps to meet defense needs, the Gulf Coast Air Corps Training Center by Dec. 1 had 6,992 aviation students under instruction—18 times its training strength in Feb. 1939, and almost 3,000 more than just five weeks previous. These latest figures released by the GCCTC headquarters at Randolph Field, Tex., received a decided boost with the recent opening of two replacement centers, one for future pilots at Kelly Field, Tex., the other for non-pilots at Ellington Field, Tex.

### 4,588 Pilots

As December got under way the area's training strength included 4,588 pilots or 12 times the number of students in the entire Air Corps during early 1939, when 384 future airmen were undergoing training at the Army's two flying schools, Randolph and Kelly Fields.

Other groups making up the 6,992 total were observers, navigators and bombardiers 233, and novices at the induction centers 2,171.

A total of 31 GCCTC schools are now either in operation or under construction, those in the latter category including three new basic flying schools at Enid, Okla., Waco and Sherman-Denison, Tex.; four advanced flight schools at Lake Charles, La., Midland, Lubbock and Mission, Tex.; and a flexible gunnery school at Harlingen, Tex.

## One of a Fleet



ONE OF THE Ryan STM-S2 seaplane trainers in use by the Netherlands East Indies government for naval pilot training, pictured at the Fleet Air Arm Base at Sourabaya, Java.

## B-19 Establishes Air Cargo Mark

DOUGLAS Aircraft Co. last month announced that the B-19 had established a new world's record for air transport of military cargo, taking off with a gross weight of 140,000 lbs.—26,000 lbs. in bombs and the remainder in fuel, military equipment and crew.

The 13-ton load of dummy bombs was equal to a DC-3 transport with 21 passengers, mail, express, cargo, crew and capacity fuel—the maximum gross weight of such a plane being 25,200 lbs. Douglas states that so confident were the plane's makers and Army officials of its ability to handle this load that Lt. Col. Stanley Umstead, pilot, prepared for an immediate take-off without the customary intermediate set-up load flights.

The B-19's weight as it taxied down the runway was nearly three times the normal gross weight of a trans-oceanic clipper. It also exceeded the gross tonnage of the 12-motored German DOX and the Russian Maxim Gorky. "Despite its spectacular loading," Douglas officials said, "the ship rose from the ground in only a few seconds more than normal take-off time, using but 3,500 of March Field's 6,000-ft. runway."

## Liberator Bomber Flies Atlantic in Record Time

A record time for the eastward crossing of the Atlantic of 8 hours 23 minutes was made early this month by a Consolidated Liberator bomber piloted by Capt. O. P. Jones, former Imperial Airways and British Overseas Airways pilot. Previous fastest west-east time of 8 hours 45 minutes was made by a Liberator and a Boeing Flying Fortress.

## Where Aircraft and Autos Meet

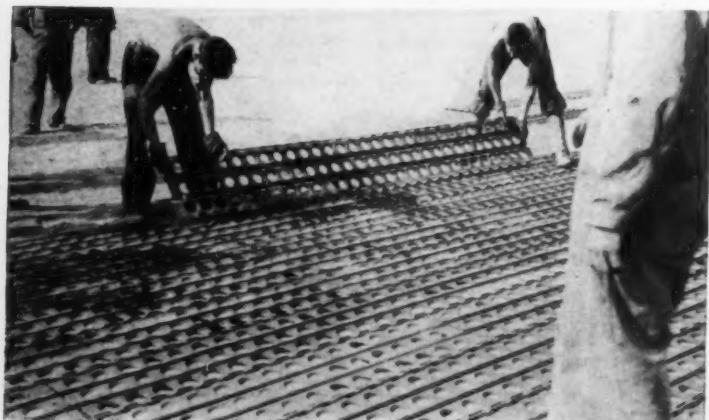
# Roadside Flight Strips Will Aid Defense



Unloading Steel Planks for Portable Airfield



Soldier Binds Sections with Spring Clips



Speed Is Essential and They Have It

## Development of Landing Areas Along Public Highways Will Serve Military Aviation Today and Civil Needs Tomorrow

By LEONARD EISERER

**C**ONSIDERED vital for adequate air defense now and destined for a major role in civil air commerce after the war, roadside landing and parking strips for airplanes are definitely on the way and within a year will dot the country at strategic points as appendages of public highways.

While the immediate flight strip program authorized by Congress in the Defense Highway Act of 1941 and approved by the President late last month is a modest one, it is looked upon by supporters as a great stride in aviation progress. The initial units provided for are seen as the beginning of a vast network of roadside landing facilities that eventually will blanket the U. S., and perhaps extend far beyond these borders, knitting closer together by air all countries of North and South America.

Locations of the first group of military flight strips for which \$10,000,000 has been authorized will be selected by the Army Air Forces with cooperation of the Commissioner of Public Roads and the regional managers of the Civil Aeronautics Administration, who will be consulted regarding the general position of these areas in relation to other landing facilities. No definite sites have yet been announced but extensive studies have already been made by the Public Roads Administration and state highway departments to determine where these auxiliary landing areas are most needed.

### About \$50,000 Apiece

Based on an estimated average unit cost of \$50,000, the \$10,000,000 fund will cover the development of about 200 projects, scarcely enough for a good sized state, but an encouraging start toward the accumulation of flight strips that will increase the effectiveness of the war effort and also prove of undoubted value when with peace the airplane becomes a common mode of travel.

With the flight strip principle endorsed by the President, Congress and the military services as of prime urgency for national defense, a continuing and expanded program seems assured.

The notion of developing landing areas for aircraft along public highways was first conceived a decade ago by Lt. Col. Stedman Shuman Hanks, military pilot in the World War and presently assigned to the Army Air Corps Ferry Command.

### Looking Southward

Now that flight strips are due to appear shortly on the domestic scene, Col. Hanks is extending his vision southward along the projected Inter-American Highway. Proposing the flight strip idea is under consideration at the Fourth Pan American Highway Conference recently held in Mexico City, Mexico. Col. Hanks expressed hope that the Inter-American Highway would prove a healthy stimulus for aviation activities south of the border.

"It would appear," he commented, "that the general purpose of this highway would be furthered by the subsequent construction of flight strips through cooperation between the U. S. government and governments of the Central American republics. This would permit increased commercial and private air traffic between the U. S. and the other American republics, and therefore would result in increased mutual acquaintance."

While no definite plans have so far been advanced for construction of flight strips in Latin America, the idea seems certain to receive serious consideration as a means of providing ground facilities in countries where regular airport developments are comparatively meager.

### Only Slight Changes

Under the Hanks' plan adopted by the War Dept., the construction of flight strips in the U. S. will in most cases involve little more than widening the highway rights-of-way or the use of roadside development areas, and the establishment of a definite line of separation between highway and flight strip.

The flight strip areas will range from 300-800 feet in width and between 3,000-8,000 feet in length, depending upon the elevation of the ground above sea level and the type of aircraft for which they are intended. Actual runway width will be not less than 150 feet for the landing of one plane at a time.

Since the runway must be straight, the strip will not necessarily parallel the highway throughout its entire length, especially in rolling or mountainous regions where few roads are straight very long. Where possible, runways will be laid out in the direction of the



Col. Hanks

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## Aviation Along Highways

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prevailing wind, which is thus expected to have an important bearing on the choice of sites. In places where the traffic is particularly heavy, a second flight strip may be constructed at right angles to the one adjacent to the highway. This would, in effect, create a four-way landing field economically and quickly.

The flight strip program, the War Dept. emphasizes, "is not intended to interfere with or detract from the present national airport program, but rather to augment and supplement it" to meet military necessity.

In general, the roadside landing areas are most urgently needed in the northeastern and northwestern sections of the country which might be the first objects of attack by foes approaching from the Far East or Europe. In these regions the Army Air Forces encounter the problem of concentrating air units and later dispersing them, and partly because of terrain conditions, these are the areas which have the least suitable number of airfields for such maneuvers.



As Flight Strip Will Look Within Highway Right-of-Way

"In the U. S. where there are extensive open areas," Col. Hanks stated, "dispersion of the units of the Air Forces for protection in a national emergency is more practicable than the use of underground hangars at air terminals. The construction of flight strips, which can be converted into airdromes for safety, supplies and emergency repairs, is also an economical means of obtaining auxiliary landing areas."

The military flight strips will be carefully located to permit the rapid scattering of planes from regular bases. Thus air strength may be massed at critical points without the hazard of having many planes destroyed in a single raid. It will be recalled that in early stages of the European war, the Nazis experienced much success in bombing airports and destroying enemy planes before they could fly into action.

Generally, the strips will be located within a radius of from five to 50 miles from air bases, enhancing their value for storing planes.

In addition to their value for dispersion and storage of aircraft, flight strips are expected to find much use as emergency landing areas for pilots in bad weather, and as refueling and servicing points for short-range warplanes shuttled cross-country by the Air Forces Combat Command and the Ferrying Command.

### Construction Will Vary

The type of construction to be used with each flight strip will vary according to local conditions, though effort will be made to develop areas where treatment of the soil will not require more than the cultivation of a heavy grass turf to make it suitable for the operation of all except the largest and heaviest of aircraft. A number of the sites, of course, will require some form of soil stabilization or the hard surfacing of runways.

While no drastic changes are anticipated in highway improvement planning, Col. Hanks has recommended that highways be placed on one side of wide rights-of-way instead of in the center, thus leaving the remainder for flight strips. It is also urged that communication lines or utility poles on the highway right-of-way near the runway be placed underground.

Construction expense of the flight strips will be kept to a minimum.

There will be no permanent buildings erected on them, no aids such as floodlights or radio installed.

One of the most ingenious devices now available for immediate application in the flight strip program is the portable runway of interlocking steel panels developed by Army aviation engineers and successfully tested in the recent First Army maneuvers in the Carolinas. Though not developed in connection with flight strips, the portable metal landing field, illustrated in accompanying pictures, is considered a "natural" for this purpose, in cases where hard surfaces are quickly needed to handle heavy planes.

### Greatest Achievement

Acclaimed by Maj. Gen. H. H. Arnold, chief of the Army Air Forces, as "the year's greatest achievement in aviation," the Marston Strip—named after the initial installation in North Carolina—can be pieced together and readied for use in less than a week. Its greatest advantages are mobility and rapidity of construction anywhere.

The runway, technically known as the "Universal steel pierced-plank landing mat," is made up of individual steel panels, 10 feet long, 15 inches wide, one-eighth of an inch thick, weighing 65 pounds each and laid transversely to the length of the runway. Each panel has a triple row of holes 2¼ inches in diameter punched out to make its weight lighter and to facilitate drainage. Two longitudinal corrugations provide extra strength and improved traction for plane wheels.

Joined together, the panels form

(Turn to page 14)

## 'Paving' the Way for Planes

Army Engineer's Gift of the Year



Rapidly the Landing Ramp Takes Form



Completed—1941's 'Greatest Aviation Achievement'



Readily Adaptable for Flight Strip Use

## Speaking Off the Record

# Healthy Course for International Carriers Being Born; Trend is Toward Competition

A POLICY to govern the future development of international air transportation is now crystallizing within federal cabinet circles where the need for a positive government position on the role of the U. S. in commercial overseas flying has long been recognized.

In spite of the war, officials are now actively shaping a long-range course which will encourage the full and healthy expansion of international air carriers under the protection of a U. S. Government policy. As yet no final policy has been declared, but persistent reports emanating from State Department quarters indicate that the trend of official thinking continues to sanction free competition by private enterprise, rather than the European system of quasi-governmental operations.

### Second String to Bow

This view was first indicated some months ago when the State Department strongly recommended to Congress that American Export Airlines be given mail pay for trans-Atlantic service. Following this same premise, officials are now reportedly advocating "a second string to the bow"—or entrance of other companies in the international field besides Pan American Airways.

But there are signs that currently officials are inclined to qualify this theory by adding a proviso that any "second string" should not "economically dislocate" existing operators. This new development is interpreted as indicating that the forthcoming policy may call for a division of world air routes among competing carriers in the same manner that merchant marine trade routes are now allocated, thus providing for a variety of opportunities for service without throwing the door open to cut-throat competition through parallel operations.

### Export Hopes for Planes

Meanwhile, American Export has filed with CAB for service to Ireland and hopes that the Navy will not seize its three flying boats but will allow the company to accept delivery of the equipment and enter operations, either independently or in conjunction with the Navy or some other federal agency. The unborn airline also hopes that all defense projects will not be awarded to PAA before its nascence.

But emergencies cannot wait. They must be considered first and the exigencies of immediate needs must also be weighed by officials in connection with the post-war future. Officials believe, however, that it is possible to frame—now—a long-range policy for the future which will "formidably entrench U. S. air operators in international service."

Concurrently, plans are advancing for further aids to Latin American countries in developing air communication.

These plans are three-fold, involving international trunk lines to Latin America; internal feeder line development with U. S.-furnished equipment and management under contracts allowing gradual acquisition of control by Latin American nationals; and, thirdly, a network of air cargo services linking all Latin American countries.

Such service by air could be achieved at relatively little cost in time or money when compared to the difficulties of developing ground transportation over the mountains and jungles.

## New Bill Would Exempt Mfrs. From Sales Taxes

EXEMPTION of aircraft and other war manufacturers from state and local sales and use taxes is the purpose of legislation now under consideration by the Treasury Department and the House Ways and Means Committee.

The bill proposes somehow to circumvent two recent U. S. Supreme Court decisions to the contrary and is said to have been cleared at the White House for early enactment.

Its sponsor, Rep. John Cochran (D., Mo.) believes the application of these local sales taxes to defense operations in practice represents an indirect tax against the federal government which would vastly increase the financial burden of the taxpayers of the national defense program.

His bill (HR 6049) is sufficiently broad in its present form to grant exemptions also for lease-lend accounts as well as all domestic defense activities for the U. S., including prime and subcontractors and covering all manner of operations from actual production to maintenance and storage of completed war supplies or parts.

## Proposal for Mechanics Training Gains Favor

AIRCRAFT MECHANICS may yet be trained under CAA direction in private schools throughout the country by passage of the Randolph bill broadening the scope of CPTP for the purpose.

Hearings on the measure opened last week before the newly created civil aviation subcommittee of the House committee on interstate and foreign commerce and, according to present indications, will conclude in an atmosphere favorable to the program.

The proposal was given considerable impetus by a sudden switch in viewpoint on the part of CAA which originally shied away from the project to avoid stepping on the toes of the National Youth Administration which now conducts an aircraft mechanics training program.

The NYA activity, however, is restricted to public institutions and does not, in the opinion of some experts, thus allow full utilization of all existing training facilities at a time when the need for building

### No Time for Prayer

Dive bombers, coming in on a line at 400 mph, are in range of a ship's antiaircraft guns only about 20 seconds. A lively Oerlikon gun crew can get about 160 shots at them in this time. Each shell will open a one-foot hole. Three or four such hits and the wind will do the rest.

up a reservoir of aviation ground monkeys is becoming increasingly important.

## Strikes, Profit Ceilings, And 'Lobbying'

ON CAPITOL HILL just before the declaration of war, Congress moved ahead with a fair amount of routine and defense business.

Widely publicized was Congressional reaction—and action—with respect to strikes in war industries and concerning control over prices.

Other measures introduced, less well known include a resolution by Rep. Hall, (R., N. Y.) to investigate Army and Navy educational requirements for pilots with a view to reducing restrictions. Senator Downey (D., Cal.) filed a resolution for a special committee to investigate the defense of the West Coast, Alaska and Hawaii.

Another investigation—of "lobbying" in connection with defense contracts, was called for in a resolution by Rep. Gehrmann (Prog., Wis.). But Rep. May's Military Affairs Committee has already begun such a probe disclosing a number of activities by so-called "defense brokers" which are being severely criticized in Congressional circles.

Meanwhile, another bill to limit profits on government contracts was presented to the House, this one by Rep. Boren (D., Okla.) calling for a 10 per cent ceiling on aircraft and other war orders.

C. W. P.

## Arnold on Air Power

(Continued from page 3)

standing speed and defensive armor and armament.

"The RAF already has many of our four-engine Consolidated B-24 bombers. The B-24 is so maneuverable, in spite of its size, that the Coastal Command has stuck four cannon in the nose, equipped it with anti-submarine devices and depth charges and used it as a fighter."

Commenting briefly on the activities of the Air Corps Ferrying Command, Gen. Arnold revealed that from June to October the Command moved 900 planes from the West Coast to eastern terminals, with only two fatal accidents and at an average of two days en route as against eight days for the earlier civilian ferry service. On a normal day in that period, 40 planes were in transit.

To date, no plane ready to leave the factory has been delayed more than 24 hours, barring zero-zero weather. Ordinarily, he stated, a pilot makes five deliveries in a 30-day period, with more than 300 ferry pilots absorbing valuable experience in concentrated doses.



THREE OR FOUR silver transports dot this photograph, but all the other ships are part of a bomber pool for England at the Lockheed factory in Burbank, Cal. The warplanes are the famed Hudson bombers that the RAF has dubbed "Old Boomerang." More than 1,500 Hudsons have risen up from this pool to fight the Battle of Britain.

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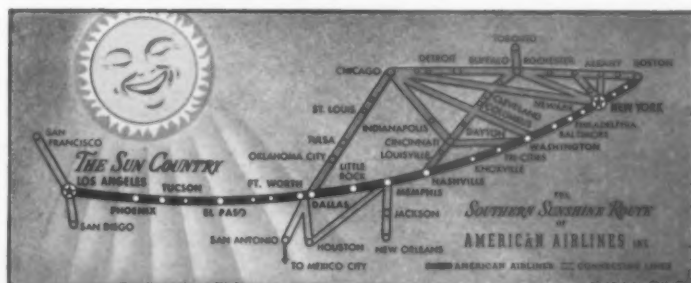
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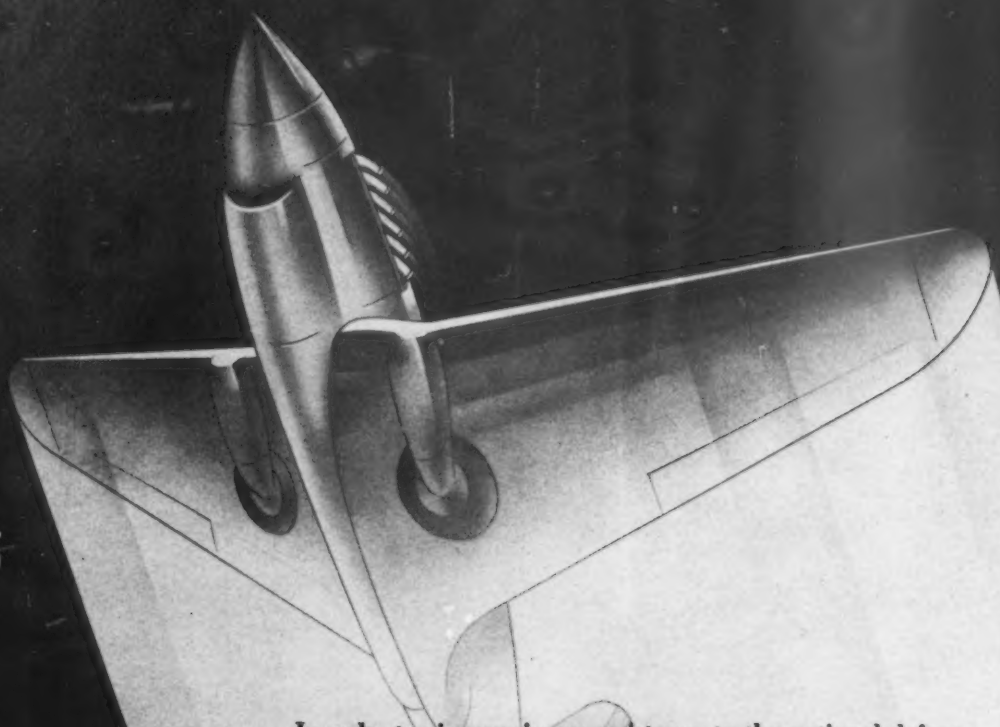
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**A**N OSTRICH with his head in the snow might properly typify many of those people who formerly traveled by air only in the summer time. Now they have learned that winter makes *less difference* in the air than it does on the ground. Above the snow and ice, the clear, clean winter air is fine for Flagship travel. This winter, as never before, the time-saving advantages of air transportation—for men, mail and materials—will prove priceless to individuals, to business and to the nation.



**AMERICAN AIRLINES** Inc.



In order to give maximum assistance to the national defense program, and for the duration of the present emergency, Cal-Aero Flight Academy, Mira Loma Flight Academy and Polaris Flight Academy will continue to devote their entire efforts and modern airport-academy bases at Ontario, Oxnard, Lancaster and Glendale, California, exclusively to the training of Flying Cadets for the U.S. Army Air Force and Royal Air Force.

CAL-AERO FLIGHT ACADEMY

ONTARIO • CALIFORNIA

MIRA LOMA FLIGHT ACADEMY

OXNARD • CALIFORNIA

POLARIS FLIGHT ACADEMY

LANCASTER • CALIFORNIA

THE TRAINING POLICY OF THESE SCHOOLS IS DEDICATED FIRST TO SAFETY AND SECOND TO TECHNICAL PERFECTION.

*C. C. Mossley*  
MAJOR C. C. MOSSLEY, PRES.

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# Aviation Shifts to War Status Quickly

(Continued from page 1)

had its immediate tempering counteraction with statements by the Civil Aeronautics Administration that civil pilots may regain their certificates and right to fly by proving citizenship and loyalty.

An additional assurance that the grounding of civil aviation was a temporary measure designed to control the air and eliminate possible sabotage from the skies, came in the announcement by Mayor LaGuardia, director of the Office of Civilian Defense, in creating the Civil Air Patrol. Its chief object will be to enlist for the duration of the war approximately 90,000 certificated pilots and approximately 100,000 ground personnel.

Maj. Gen. John F. Curry, U. S. Army Air Corps, has been assigned by the Army to the Office of Civilian Defense and was designated by Mayor LaGuardia as National Commander of the Civil Air Patrol.

## Aide to LaGuardia

Gill Robb Wilson, state aviation director for New Jersey and president of the National Aeronautic Association, who has been largely instrumental in the formation of the Civil Air Patrol plans, has been appointed executive officer to serve under Gen. Curry. Maj. Reed G. Landis, veteran pilot and until recently a vice president of American Airlines, has been named as Aviation Aide to Mayor LaGuardia.

The Mayor's announcement said: "It is the object of the Civil Air Patrol to enlist, train and discipline civil aviation personnel and materiel so that their potential value to defense may be made available immediately. The potential value would be enhanced by the voluntary completion of training courses provided by national headquarters of the Office of Civilian Defense with the cooperation of the War and Navy Departments and the Civil Aeronautics Administration."

Organized on a regional Corps Areas and state basis, it was announced that the first meeting of state commanders was to have been held in Washington Dec. 11-13 at which time full details of the program would be revealed. Booklets describing the program, and how enlistments may be made, are to be mailed out to all CAA offices and airports starting the week of Dec. 15.

## Suspends All Permits

The CAA emergency order issued on Dec. 8 suspended all pilot certificates except those held by pilots employed as such by scheduled air carriers, but provided for releases from suspension as follows:

a. For pilots at schools where training activities are being conducted for the government, by the senior supervising Army or Navy representative or by the CAA representative whose signature across the certificates shall indicate that he is satisfied that the holder is an American citizen of unquestionable loyalty.

b. For pilots at aircraft manufacturing plants and at other defense manufacturing plants, by the senior Army or Navy inspector supervising the activities of the plant in the same manner as indicated in a.

c. In ferry activities, by the responsible Army or Navy officer in the same manner as indicated in a.

d. All other certificates may be reinstated only after satisfactory evidence of citizenship and loyalty accompanied by positive identification has been accepted by a designated representative of the CAA.

e. At all times, reinstated certificates shall be considered valid only when the holder presents with the certificate positive proof of identification.

Brig. Gen. Donald H. Connolly, CAA Administrator, who made the announcement, said that these requirements are applicable at this time only to the continental limits of the U. S., its territories and possessions and the District of Columbia.

## Hinckley Acts

Following up Gen. Connolly's orders, Robert H. Hinckley, Assistant Secretary of Commerce for Air, sent the following telegram to all state governors:

"Request immediate steps to be taken to assign properly authorized police officers to all known landing fields for aircraft for protection of field facilities and to hold such aircraft on the fields unless they are aircraft engaged in scheduled air transportation or are publicly owned or operated under contract with the federal government pending the issue of instructions as to how such aircraft may be permitted to take the air by properly accredited representative of the Civil Aeronautics Administration or by a Commanding Officer of an Army or Navy station and pending further instructions for the formation of the Civil Air Patrol as communicated to you a few days ago by the Office of Civil Defense. Urgent."

Civilian Pilot Training schools were almost immediately relieved of the suspension orders, but a number of private pilots were ordered grounded pending their release from the restrictions. Although the orders are not designed to affect the vast majority of private pilots and private aircraft, they will keep out of the air all pilots who are not citizens and all those with criminal records.

## Off to Maneuvers



SHORTLY AFTER this photo was taken, these 14 North American B-25 medium bombers left Los Angeles Municipal Airport to join the 17th Bombardment Group and 89th Reconnaissance Squadron in maneuvers at Augusta, Ga. The ships were under the command of Maj. John J. O'Hara.

On the manufacturing front, Col. John H. Jouett, president of the Aeronautical Chamber of Commerce, told AMERICAN AVIATION DAILY: "If it is possible for us, the aircraft manufacturers of this country, to view our responsibilities any more gravely than we have in the past, this dastardly attack by the Japanese fills us with the greatest incentive. The aircraft industry pledges that it will not relax its utmost efforts until the war is won. It is our firm belief that we can continue to produce enough aircraft so that they will be a decisive factor in the war on all fronts."

Under-Secretary of War Robert Patterson ordered maximum production efforts in a message to his procurement chiefs. "All officers and civilian employees to be required to work as many additional hours each day as is necessary to get the day's work done," he ordered.

"You are directed to take all necessary steps to boost munitions manufacture to the highest possible level. Additional overtime work and second and third shifts must be arranged. Our production must be put on a 24-hour a day basis immediately. You are directed to take such steps as will achieve this as quickly as possible."

## Ban on Japanese

Up to press time, air transport companies had received no orders other than to keep Japanese off their planes. The question of seat priorities was expected to be settled within a few days, and air express shipments were undergoing close inspection at all points over the country. No request had been made by either Army or Navy for pooling of equipment in an emergency, but a plan was understood to have been worked out if the need arose.

Pan American Airways suffered one airplane loss on its Pacific route. A Sikorsky S-42 which has been used as a shuttle between Manila and Hong Kong, was bombed and destroyed in the harbor at Hong Kong during the first Jap attack on that city. The airline re-

ported that no personnel had been killed or injured in any of the Pacific raids, but that the company personnel at Wake Island had been evacuated by the Philippine Clipper a few hours before the Japs raided the island. Pan American's communication system continued to function at every point except Wake Island. A west-bound clipper out of San Francisco and due to arrive Sunday morning at Honolulu, returned to the mainland safely.

## Hearings on Schedule

The Civil Aeronautics Board announced that it would continue to hold hearings on schedule for the time being, but would be ready at an instant's directive to hold any hearing necessary to the war effort and indicated that any such hearings would be conducted in secret session.

A new element entered the airline route picture Dec. 8 when a significant statement from the War Department was read into the record by Major E. F. Gillespie, of the Army Air Staff, as the CAB hearing opened on the application of American Airlines for a route to Mexico City from El Paso and Ft. Worth. The War Dept., he said, "in the light of recent events . . . will no longer tolerate the subordination of national defense interests to the commercial aspirations of any air carrier."

"This statement," said Major Gillespie, "is intended not only for the present application but for all air carriers, and it is hoped that they will bring that complete cooperation which is essential to the present undertaking in which we are all engaged."

While not directly endorsing the application of American, Major Gillespie did state that the airway proposed by American would be of use to the Air Forces. Observers considered this to be as near an endorsement of American's application as the War Dept. would give. It seemed clear that no new airline route application would receive consideration unless it has value to the national defense.

## Army-Navy Briefs

**Air Base Command**—To supplement work of the recently created Air Service Command, the War Dept. is speeding formation of a new Air Base Command responsible for keeping planes flying along battle fronts. While the Air Service Command is essentially a rear echelon charged with maintaining a steady flow of supplies among the various air depots, the Air Base Command, mostly mechanics and technicians, will repair and service planes in forward areas of operation. It will be a mobile unit, but of sufficient strength to convert fields and pastures into airdromes wherever needed.

**Floyd Bennett Field**—The Navy, which is currently paying the City of New York \$50,000 a year rent for use of Floyd Bennett Field as a naval air station during the emergency, now proposes to buy the field outright for \$10,000,000.

**Civil Pilot Licenses**—Under revised and simplified procedure military pilots may obtain an initial or renewal civil certificate simply by filing with Civil Aeronautics Administration evidence that they are on flying status, together with a statement from operations personnel showing types, class and horsepower of aircraft piloted and the hours logged in each type.

**New HQ Post**—Hq & Hq Squadron, Third Air Force Base Command, have been transferred from Savannah, Ga., to Drew Field, Tampa, Fla.

**Combat Crewmen**—Eligibility requirements for Army air navigators

and bombardiers have been lowered to assure an adequate force of these crewmen for the mounting number of long-range bombers rolling off assembly lines. Graduates of accredited high schools, 20 to 26 inclusive, upon passing an Air Corps intelligence test are now being accepted for a joint navigator-bombardier training course designed to turn out a minimum of 10,000 specialized crewmen by the end of 1942. The Air Corps previously required at least two years college training or its equivalent for these specialists. Combining the courses is also an innovation, since heretofore navigators and bombardiers have been trained separately.

**Biggest Bomber**—Air Corps last week formally accepted the Douglas B-19, world's biggest bomber, and intends to transfer the plane from Clover Field, Santa Monica, Cal., to Wright Field, Dayton, O., early next month.

**Ferrying Safety**—In an official statement issued Nov. 27 on Air Corps Ferrying Command operations (described in AMERICAN AVIATION, Oct. 1), the War Dept. indicated that "more than 3,000,000 miles of safe delivery flights" have been accomplished by the ACFC.

**Gen. Lahm Retires at 64**  
Maj. Gen. Frank P. Lahm, the Army's first pilot, relinquished his last command—that as head of the Gulf Coast Air Corps Training Center—Nov. 30, when he reached the statutory retirement age of 64. A giant ground and aerial review was held at Randolph Field, Tex., in tribute to Gen. Lahm's service.

## Flight Strip Program Approved

(Continued from page 9)

a continuous runway 150 feet wide and 3,000 feet long, the precise size proposed for many of the flight strips.

The pierced-plank landing mats provide a natural camouflage, since the holes permit grass and weeds to grow between them leaving the runways practically invisible to unfamiliar eyes. It might be made to look like a cornfield, or as is now practiced in Europe, camouflaged by painting a road through it. Any structures on the flight strip could then be disguised as farmhouses and barns.

Almost every type of plane used by the Air Forces has successfully tried out the metal strip, the tests showing that rain does not make the surface slippery, that the strip is as easy to get into as a regular landing field, and that there is less wear on the rubber tires of the landing gear than there is on a concrete runway. Also, while flexible enough

to conform to general topography, the mat is yet rigid enough to bridge over inequalities in the ground.

The mat is described by the War Dept. as having the bearing strength of four inches of concrete, and weighing about 1,000 tons. During installation of the Marston Strip, one crew of 75 soldiers achieved a speed of one foot a minute, laying four of the 15-inch strips across the 150-foot wide mat in five minutes.

Important feature of the new portable runway is that the fabricated steel of which it is made is one of the most readily available steel products at present.

According to reports from abroad, the British, French and Germans have developed similar types of portable runways, employing steel grating to be laid on soft or uneven land for temporary airfields and to bridge bomb craters at airports.

As with flight strips along high-

ways, the portable runway idea, while conceded to have a civil future, will for the duration of the war be devoted to military purposes.

But with the coming of peace, the sky will be filled with private planes, making the need for adequate ground facilities greater than ever. Just as suitable roads for speed and safety had to be constructed before the automobile came into general use, so good landing and take-off facilities must become commonplace before civil aviation can reach its fullest development.

Thus, while flight strips for the immediate future will be constructed for military expediency, the program is nevertheless in keeping with long-range planning for air transportation. Flight strips which today permit squadrons of bombers and fighters to be concentrated near the airports of major cities, tomorrow will prove of continued value as landing and storage

## Fortnightly Summary

### OFFICE FOR EMERGENCY MANAGEMENT

Readers wishing to obtain the complete announcement on a subject mentioned below should address their request, with appropriate key number as shown, to Office of Information, Office for Emergency Management, New Social Security Bldg., Washington, D. C.

#### Priorities

**Steel Preference Order:** General preference orders issued extending present regulations for pig iron, steel, and special kinds of iron and steel. (PM 1626).

#### Division of Contract Distribution

**Muskegon Certified:** Muskegon, Mich., certified to War and Navy Dept., as distressed area requiring 2,250,000 man-hours of contracts, including aviation. (PM 1634).

**New Field Offices:** Regional headquarters located at Miami (514 Congress Bldg.), Shreveport, La. (918 Giddens Lane Bldg.), Toledo (519 Spitzer Bldg.), Manchester, N. H. (Amoskeag Industries Bldg.), Reno, Nev. (Saviers Bldg.), Columbia, S. C. (Manson Bldg.), Erie, Pa. (Erie Trust Bldg.), Montpelier, Vt. (12 State St.).

**Permanent Exhibits Planned:** Sixteen cities to get permanent exhibitions of equipment and parts needed by defense program. Interested manufacturers by Jan. 1 may visit displays at New York, Chicago, St. Louis, Philadelphia, Cleveland, Detroit; shortly thereafter shows will be set up at Atlanta, Boston, Cincinnati, New Orleans, Pittsburgh, Seattle, Birmingham, Buffalo, Kansas City, Los Angeles. Total of 50 exhibits are planned ultimately.

#### Lend-Lease Administration

**Aid Total Reaches Billion:** Actual aid totals \$1 billion, with contracts let for more than 75% of the first \$7 billion allocation (LLA 1).

#### Office of Price Administration

**Zinc Price Fixing:** List of maximum prices for rolled zinc sheets, strips and plates prepared in light of recent 1c a pound increase in price of slab zinc. (PM 1664).

**Oil Industry Prices Fixed:** Price Administrator explains request to petroleum industry to maintain price levels prevailing Nov. 7 (PM 1662).

#### Labor Division

**How to Get Defense Work:** Division economist's 10-point plan to be followed by non-defense industry and its labor organizations in cooperation with government to get defense work and avert priority unemployment. (PM 1720).

#### Supply Priorities & Allocations Board

**Copper Production:** Public hearings decided upon (date to be set later) to study all possibilities of increasing copper production (SPA 19).

#### Other OEM Statements

**Expansion of Aircraft Plants:** Table shows that 334 aircraft plant expansions were approved by government agencies in September, representing cost of \$974,761. Other industries' totals also appear, but no breakdown is provided by companies or areas. (PM 1598).

**Lockheed Hiring Policy Commended:** President's Committee on Fair Employment Practices commends Lockheed Aircraft Corp. for "sympathetic and intelligent program of eliminating discrimination" based on race, creed, color or national origin, citing that the firm in past three months trained and employed 125 Negroes. (PM 1699).

areas for private planes.

Located adjacent to existing highways and with regular highway building machinery used in their construction, flight strips offer a means of developing aviation facilities at a minimum cost. Small communities and cities that can ill afford the expense of regular airports should be able to maintain flight strips, and thus bring aviation into the everyday lives of the vast populace.

#### Defense Train Success

Defense Train No. 1, dispatched from Washington by OPM to tour the eastern U. S., has located 17 new sources for products which the Navy's Bureau of Aeronautics was finding it difficult to obtain. The new sources include machine shops capable of handling work with which the Naval Aircraft Factory at Philadelphia is at present overloaded.

# This we have, this we hold



**T**HERE IS THE RIGHT of a man to stand on his own two feet, and with his own hands and talents carve out a place for himself and his family.

There is the right of a woman to look hopefully ahead, to raise up her brood in dignity and self-respect, undictated to save by her own mother-wisdom and conscience.

There is the right of a boy to lead the hale, free life of boys, flying kites when the wind blows, playing cops and robbers when he wants, going to school when he must—and out of it all somehow shaping a future to a good pattern.

There is the right of a small child to its chance for health and love and laughter, to a good start toward who-knows-what fine and useful life in years to come.

Simple things, aren't they, these things that spell America and add up to freedom!

So simple, so wholesome, it seems daft that somewhere bombs scream down to blast them, tanks lunge to crush them, bullets fly to drive from the minds of men the idea that these are their rights, inalienable.

But the bombs do fall, the tanks do roll, the bullets do fly—and in such a world our only shield seems to be more bombs of our own with bombers

to carry them, more tanks and the cannon to arm them, more bullets and faster guns to fire them.

So it is that from Goodyear factories meant for building things to enlarge life and make it better, now must flow in a swelling tide the things our country needs if we are to hold what we have.

Skills and facilities developed that a peaceful world might have better tires, floor coverings, soles and heels, transmission belts and a thousand like useful things, now focus on the making of barrage balloons, bomber wings and tails, bullet-puncture-sealing inner tubes and fuel tanks, gas masks, rubber tank track treads and a host

of other Goodyear-made defense products.

This is no choice of ours—like yourself, we would far rather spend our days making this a land where life can be richer, liberty enjoyed, where the pursuit of happiness can go steadily on.

But when the decision lies between helping our government prepare for impregnable defense of such things, or running the risk of having them swept away, there is no option and we feel as we know you do.

That which we in America have, we intend to do our part to hold.

Compared with holding it, what else matters?

## AMERICA MUST BE FIRST IN THE AIR

Unless and until America is the most powerful nation in the air, our safety, our freedom, and our standard of living will not again be what they have been in the past.

*Phil Kitchell*



# GOODYEAR

GOODYEAR DEFENSE PRODUCTS HELP "KEEP 'EM FLYING"

# American Aviation

The Independent Voice of American Aeronautics

Published the 1st and 15th of Each Month by

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## Fortnightly Review

(Continued from page 1)

pilot training, for airplanes! But, said Longfellow almost a century ago, "Look not mournfully into the past. It comes not back again. Wisely improve the present." War has come and we can only go forward and build with what we have.

The effect on U. S. aviation will be profound. A multitude of war-time adjustments will be necessary. Thanks to a handful of wise planners, civil aviation will not be grounded during the war, although it was civil aviation that bore the first brunt of the war itself by being grounded. Through the good offices of Gill Robb Wilson, president of the National Aeronautic Association, of the Aircraft Owners and Pilots Association, of the Civil Aeronautics Administration, and of a sympathetic Army, civil aviation will have a place in war-time life in the U. S. For manufacturers and scheduled airlines, the war means more hours of work, more diligence, more effort of men and equipment.

Less than a week before the first bomb was dropped on a surprised Hawaii, Maj. Gen. H. R. Harmon, Commanding Officer of the Gulf Coast Air Corps Training Center, struck the keynote of air power in a talk before the National Aviation Training Association at Kansas City.

"If it is to be war," Gen. Harmon said, "our prime need is an invincible, yea, an overpowering Air Force—a bigger and better air force than Hitler ever even dreamed of. Only an air force can reach and reach in time the many points of vast strategic importance which exist now in this worldwide struggle—the Burma Road, Murmansk, North Africa, Moscow, the oil fields of the Caucasus. Only an Air Force can fight in New England today, on the Pacific Coast tomorrow."

U. S. aviation will not shirk from its destined job.

## Pepping Up Production

A COMMENDABLE war-time activity in Canada to raise the morale of aircraft workers and to aid in speeding production might well be adopted in the U. S. Through the courtesy

of B. W. Franklin, manager of the aircraft division of Canadian Vickers Ltd., we have received samples of the posters and pamphlet material disseminated by one means or another to the management and workers of Canada's aircraft industry. Notable contributors to the scheme are the two aviation journals, *Canadian Aviation* and *Commercial Aviation*, while the main spring behind the drive is dynamic and well liked Ralph P. Bell, Canada's director-general of aircraft production. So effective has been the campaign that newspapers have reprinted Mr. Bell's "pep talks" to management and workers. Now that we are officially in the war, a similar campaign in this country would be desirable.

## A & E Mechanics Needed

THE HOUSE Interstate and Foreign Commerce Committee is currently considering Representative Jennings Randolph's bill to amend the Civilian Pilot Training Act so that mechanics as well as pilots, can be trained by government funds in private A & E schools. Speedy action is needed. There is no substitute for the thorough training offered by existing approved private schools; their services should be fully utilized during the emergency. So far they have been largely left out of the defense program. Their enrollments have been cut by free government courses in a few phases of aircraft work. The impending acute shortage of A & E mechanics can only be met successfully by using private schools to capacity.

## The Story of Chkalov

FEW AVIATION movies warrant mention outside the newspaper film columns but we commend a new Soviet release to you if it comes your way. Called "Wings of Victory" and well supplied with English sub-titles, the film tells the story of the late Valeri Chkalov, one of Russia's legendary air heroes who died in 1938. A stunt and test pilot, Chkalov will be remembered in this country as director of the 1935 flight from Moscow to Vancouver via the Pole. Here is an aviation movie with a factual background without the usual outlandish Hollywood trimmings. While the film reveals little of Soviet aviation, it is a production of merit. It has been released in the U. S. by Artkino, Soviet film agency.

## The 10,000th Cub

COMPLETION of the 10,000th airplane by Piper Aircraft Corp. late in November is a milestone in civil aviation. Mr. William T. Piper, an intrepid pioneer with boundless faith and courage, has established an enviable record. It is pleasing to know that he was one of those carefully considered for the Collier Trophy, for his contribution to civil aviation has been a real one. Our congratulations!

## Worthy Promotion

APPOINTMENT of Lt. Col. Arthur I. Ennis as chief of the public relations division of the Army Air Forces is gratifying and a real service to newsmen. Col. Ennis has a long record in the Air Corps, knows newsmen and their problems as well as Air Forces news. It was a highly acceptable promotion and we wish him well.

## First Helicopter Passenger

Grover Loening, well-known airplane designer whose association with aviation goes back over a quarter of a century, claims he is the first helicopter passenger in the history of aviation. As chairman of the board of Platt-LePage Aircraft Corp. of Philadelphia, he was taken up recently as first passenger in the two-place helicopter developed by that company. Development of this type of aircraft is getting top attention in many aeronautical circles. The Sikorsky and Platt-LePage models differ markedly in principle of design, but both are achieving the same objective and the proponents of the helicopter firmly believe this type of craft is the answer to private flying and opens up enormous aerial horizons for the post-war period.

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## Pro, Con and Otherwise

### State Rights

In thumbing through your Nov. 1 issue, I note with some interest the statements you made on page 12 under the column "From State to State." I think your article as regards the Michigan finger printing and badges is very well set forth; however, I note that in citing the registration of landing areas in the state of New Hampshire and your remarks as regards activity in other states, you are not aware of the fact that Michigan has been licensing airports and landing fields and airport managers since 1930.

In the case of the licensing of aviation instructors, I believe that Michigan was one of the first to realize that a man might be an excellent pilot and still be a lousy instructor, and in order to properly supervise the training of student aviators, we went into the business of licensing flight instructors.

The interesting part about it is that in the early days of the checking of so-called instructors, we time after time found pilots that could not spin an airplane—their conception of a spin was a spiral. In many instances we made recommendations to the old Dept. of Commerce that a pilot be re-checked for the grade of license he then held because in our opinion he was not qualified to be a transport pilot, which was the license then issued.

Since the advent of the certification of instructors by CAA, we are still issuing flight instructor licenses; however, we no longer give tests for that license but recognize the pilot's CAA rating as an instructor and automatically issue the state certificate.

Our reason for still issuing the state certificate is that this office cannot touch a federal certificate in the case of the man being a violator, or, in the case of any other operation which might prove detrimental. By his being required to hold a state certificate, we can at least stop his operation as an instructor within the state boundaries.

Regarding the state licensing airports and landing fields used for commercial purposes, we believe that this is still an important state function and is necessarily the right of the several states, and I believe that if other states took the same action it would avoid the tendency on the part of CAA to take over that prerogative.

Our policy has always been that whereas we set up minimums for such licenses, we are still in position to grant temporary permits for short periods of time wherein the operator is allowed to bring his field up to or above the minimum specified without affecting his operation, and inasmuch as he is dealing with local people entirely conversant with his problems he feels that he is being given a fair shake.

In the case of our licensing airport managers, it gives us immediate control over the field under his jurisdiction, and makes it mandatory that he enforce all the state requirements and regulations. I can readily visualize, however, a lot of difficulty if the CAA embarked

upon such a program because I don't believe that such a program can be handled by remote control and neither do I believe that there is any need or necessity for such a federal requirement.

I believe that the several states should take immediate action toward this end thereby exercising the state's full rights and obviating the necessity on the part of the federal government. It is quite possible that we have some states that are of the opinion that if we "let George do it" it will be done far better, or that if they, themselves, hang back, someone else will do it for them, and of course this is pretty apt to be so; but after they have waited and someone else has done it for them, they will be the first to holler the loudest over the fact that someone else has exercised all of their prerogatives for them.

S. B. STEERS, Director  
Michigan Board of Aeronautics  
Lansing, Mich.

(To clear up the point raised regarding the article mentioned, we call attention to the statement therein that the features cited for the particular states are "but a few of the aviation activities initiated by the states." The article in question made no attempt to summarize the activities of the various states, but merely focused attention on certain elements of state regulation that might in the future be paralleled by federal control.—The Editors.)

### Inconvenience

Three times recently I have had occasion to meet friends on incoming planes at Washington National Airport. I was greatly annoyed and inconvenienced by the fact that these planes were not announced on the public address system until several minutes after they had landed. This created confusion and led to difficulty in locating the persons on the planes.

Inasmuch as Washington National is supposed to be the country's finest airport in all respects, I should think that the airlines would make every effort to keep their services even better than they are at other fields. At Chicago, for instance, planes are announced while they are approaching the field.

B. E.  
Washington, D. C.

### Douglas' Essense

The Douglas Aircraft advertisement in your Dec. 1 issue, page 35, uses the word "essense." My dictionary spells it "essence." Why didn't AMERICAN AVIATION catch this slip-up?

AUSTIN SIMMONS  
Milwaukee, Wis.

(The editors noticed the error shortly before press time, but remaining time was insufficient to make the change inasmuch as it would have been necessary to re-letter the word on a proof and then engrave a new makeshift electroplate—which would likely have been of inferior quality.—Ed.)



Courtesy of Broadcasting; drawn by Sid Hix

"It's the Radio Station—They Say You've Just Won a Piper Cub Airplane!"

### Seaplane Floats

On page 28 of your Oct. 15 issue you published a table entitled "Six Months U. S. Civil Aircraft Production."

In this schedule you list under "Seaplanes,"

Single engine, 1941... 3; 1940... 10  
Multi-engine, 1941... 5; 1940... 0

We would be very much interested to know how you arrived at these figures, as we have produced and sold more floats in the last two years for civil aircraft than ever before and the quantities run into rather high figures. The figures as published in the reference chart are certainly very, very far from correct and give a most misleading picture of the seaplane situation.

HENRY Y. SATTERLEE  
Sales Department  
Edo Aircraft Corp.  
College Point, N. Y.

(The Civil Aeronautics Administration, the source of these figures, concedes that the totals as given above create a misleading impression of the seaplane situation during the periods involved. As explained by CAA, many civil planes are turned off the assembly line as land-planes—and so appear in that category in the records—but are later fitted with floats for seaplane operation. Also it is suggested that a number of the Edo floats were sold for use on planes produced in previous years.—The Editors)

### Kudos

I have been a subscriber to AMERICAN AVIATION since about June 1938 and still look forward for each issue. It's the best aviation magazine.

JACK TOURTELOT  
National Airlines  
New Orleans, La.

### Detroit Show Jan. 17-25

Dates of the International Aviation Show and Light Plane Exhibit at Detroit have been changed from Nov. 28-Dec. 7 to Jan. 17-25. The erroneous listing was carried in AMERICAN AVIATION and other aviation publications because of confusion resulting from the postponement.

Headquarters for the show are located in the Detroit-Leland Hotel, Detroit.

### Calendar

(Events listed below are subject to cancellation without notice)

DEC. 16—Meeting in Honor of the Wright Brothers and 32d Anniversary of the Aero Club of Pennsylvania, Hall of Aviation, Franklin Institute, Philadelphia, Pa.

DEC. 17—8th Annual Observance of Man's First Powered Flight by the Wright Brothers. Sponsored by the Committee for Aviation Day in Atlantic City, Haddon Hall, Atlantic City, N. J.

DEC. 17—Institute of the Aeronautical Sciences, Wright Brothers Lecture, "New Pathways in Aeronautical Theory," by Richard Southwell, Professor of Engineering Science, Oxford University, England; at the Pupin Physics Laboratory, Columbia University, New York, N. Y.

JAN. 10-11—Dedication of Bomber Assembly Plant to be Operated by North American Aviation Inc. at Fairfax Airport, Kansas City, Kan.

JAN. 12-16—Annual Meeting and Engineering Display, Society of Automotive Engineers, Book Cadillac Hotel, Detroit, Mich.

JAN. 17-25—International Aviation Show and Light Plane Exhibit; Headquarters, Detroit-Leland Hotel, Detroit, Mich.

JAN. 27—Institute of the Aeronautical Sciences, Honors Night Dinner, Hotel Waldorf-Astoria, New York, N. Y.

JAN. 28-30—Institute of the Aeronautical Sciences, 10th Annual Meeting, Pupin Physics Laboratories, Columbia University, New York, N. Y.

FEB. 21-MAR. 1-2d Eastern Light Airplane Exhibition, Grand Central Palace, New York, N. Y.

APR. 23-25—5th Annual Southwest Aviation Conference, Hotel Muehlebach, Kansas City, Mo.

APR. 23-25—Women's National Aeronautical Association, Annual Convention, Hotel Phillips, Kansas City, Mo.

MAY 1-2—3d New England Aviation Conference, Providence, R. I.

# Engine Output Nears 6 Million hp. Monthly

## Production Seen Surpassing That Of Japan, Germany

By CHARLES ADAMS

WITH TWO companies, Wright and Pratt & Whitney, now turning out over 2,000,000 hp. apiece monthly, at full war-time speed U. S. aircraft engine production in December is expected to total between 5,500,000 hp. and 6,000,000 hp., 12 times the rate at the outbreak of the European war in 1939.

So fast has this nation's engine production risen during this year that fears of a shortage have long since been erased as reflected in the large numbers of units being exported. During the first eight months of this year, over 5,000 spares (over and above the number of engines sent abroad in planes) were exported.

Probably most important, in view of the declaration of war, is that most experts believe the U. S. alone is producing more engines than Germany and Japan combined. Japanese production was recently placed at under 5,000,000 hp. annually, less than this nation produces in a single month. The Japs are known to have been striving to make their most powerful engines turn out 1,000 hp. when this country had 2,000-hp. models in production.

As for Germany, Eugene E. Wilson, president of United Aircraft Corp., recently estimated the Reich's monthly output at 3,500,000 hp. He added that Britain's was around 1,750,000 hp.

### Steady Rise in U. S. Output

Unlike the trend of military plane production, which showed declines in three of the first eight months of this year, U. S. engine output has shown a steady rise. OPM figures for the first nine months of 1941, and reliable estimates for the last three months, are:

January .....	2,305,610 hp.
February .....	2,627,260 hp.
March .....	2,972,400 hp.
April .....	3,278,710 hp.
May .....	3,319,625 hp.
June .....	3,365,695 hp.
July .....	4,162,013 hp.
August .....	4,328,045 hp.
September .....	4,343,600 hp.
October .....	4,500,000 hp.
November .....	5,000,000 hp.
December .....	5,500,000 hp.

That engine production will keep pace with rising plane output is believed certain by defense officials, who point out that Studebaker, Ford, Packard, Buick and Chevrolet will all get into volume production in 1942.



THIS BUICK aircraft plant at Melrose Park, Ill., which includes 1,320,000 sq. ft. of floor area in the main building and 170,000 sq. ft. in the test cells, next year will get into mass production of 1,200-hp. Pratt & Whitney engines. Ultimate goal is 1,000 units a month, with productive personnel to exceed 10,000. Total cost of plant and equipment, including tooling

at Flint, Mich., where some of the parts will be fabricated, was approximately \$41,000,000. Buick holds \$129,000,000 in Air Corps contracts. Above photo shows rear view of plant including main manufacturing building and production and engineering test cells. Albert Kahn Inc., Detroit, was architect.

Present status of the three principal engine producers and outlook for next year are:

• Pratt & Whitney: Production of 2,000,000 hp. was achieved in November, compared to 1,700,000 hp. in August and less than 1,000,000 hp. in Nov. 1940. Company is about 4,400 engines, or between two and three months, ahead of schedule. This being the case, maximum production of about 2,800,000 hp. monthly is expected at East Hartford by next fall, instead of in 1943 as originally planned. The Pratt & Whitney plant now employs about 21,000 workers and has a factory area of 2,100,000 sq. ft.

• Wright Aeronautical: Combined output of Paterson and Lockland, O., units is well over 2,000,000 hp., the latter factory having reached the mass production stage in November. Wright's Paterson plant has been beating its schedule since March, but output showed a tendency to level off during the summer as the unit approached capacity. Production at Lockland has recently caused the total to rise sharply. A rather steep upward trend will probably continue until next summer when Lockland is expected to reach capacity of around 2,000,000 hp. monthly. Total output of both Wright plants will approach 4,000,000 hp. monthly before the end of 1942.

Personnel at Lockland is about 8,000, floor area 2,120,000 sq. ft.; Paterson employment is around 20,000, floor area 2,856,000 sq. ft.

• Allison: Achievement of a production rate of 1,000 liquid-cooled engines a month was expected in December. This compares with 350 last March and about 700 in August. Production is reported on 1,090-hp. and 1,150-hp. units, although the company is prepared to turn out 1,325-hp. models. Output in units is not expected to advance materially during 1942, but the horsepower rating of the average Allison will be higher.

Company now employs about 12,000 workers at Indianapolis, Ind.

### Peak Production in 1943

Peak military production of 15,000,000 hp. monthly, expected in

1943 by the Aeronautical Chamber of Commerce, will probably be divided something like this:

Pratt & Whitney, East Hartford, 2,800,000 hp.; Wright, Lockland, O., 2,100,000 hp.; Wright, Paterson, N. J., 2,000,000 hp.; Ford (P & W) 2,000,000 hp.; Packard (Rolls-Royce Merlin) 1,050,000 hp., but company may then be producing a higher-powered unit; Buick (P & W) 1,200,-

000 hp.; Studebaker (Wright) 1,200,000 hp.; Allison, 1,300,000 hp.; Chevrolet (P & W) 1,200,000 hp.

In units of military planes compared to units of military engines, production should be along this order: Oct. 1941, 2,275 planes, 4,700 engines; July 1942, 4,000 planes (including at least 500 heavy, four-motored bombers), 12,000-14,000 engines.

## Coburn to Head Air Associates; Dies Hits Army's Seizure Action

FREDERIC G. COBURN, chairman of the board of McLellan Stores Co., has been elected president of Air Associates Inc., but reverberations of the long and bitter union-management struggle which brought seizure of the Bendix, N. J., factory by the Army and culminated in ousting of the firm's two top executives continued on Capitol Hill.

The War Dept., which on Oct. 30 had moved troops into the Air Associates plant to end a UAW-CIO strike, the third in several months against the management headed by F. Leroy Hill, praised Coburn's selection and stated it was confident that the factory could soon be returned to private control.

### Held Positions in Aviation

Coburn, a graduate of the U. S. Naval Academy, designed and was in charge of building and operating the Naval Aircraft Factory, Philadelphia, during the World War. After employment with Bethlehem Shipbuilding Corp., he became president of Aviation Corp. and of American Airways in 1930, serving until 1932. He became president of McLellan Stores in 1936 and early this year chairman of the board. He was also named a director of Republic Aviation Corp. this year.

Meanwhile, Rep. Martin Dies, on Dec. 2, charged on the floor of the House of Representatives that the Army's seizure of the Air Associates plant was "a part of one of the most amazing stories of official groveling before Communists and criminals ever recorded." He further asserted that five of the UAW

organizers at Air Associates had criminal records, as follows:

### Records Revealed

Organizer John J. Bonner—1936 three years for grand larceny; 1937 after having been paroled, second sentence of three years for grand larceny; 1938, 18-year term for third degree burglary, of which 10 years were served.

Organizer Joseph Doucette—1933 robbery. During next 10 years he was charged with and convicted for breaking, entering, larceny, receiving, petty larceny, robbery and larceny on four counts.

Organizer Ferdinand Galatioto—1926 to 1941 served prison terms for petty larceny, parole violation and carrying concealed weapons, being paroled in 1941 during third year of a seven-year sentence.

Organizer Allen Marcus—convicted for burglary and petty larceny.

Organizer Edwin Morris—sentenced to one to two years for receiving stolen property.

### Sees Stealing as 'Prerequisite'

Dies commented that "conviction for some kind of stealing seems to have been a prerequisite for getting an organizer's job in the UAW at Air Associates."

R. J. Thomas, president of the UAW, when informed of Dies' charges, declared that none of the men mentioned was ever employed by the union. "I am informed," Thomas countered, "that they were employed as strike breakers and guards by Air Associates."

Queried for a rebuttal, Dies' office reiterated its statements, adding that "a union which can keep all its records secret can't be expected to admit anything."



## HOLDING TIME BY THE TAIL

### *Airlines Save Years in Defense*

**H**OLDING back the clock . . . turning travel hours into work time, the airlines are helping this country's defense production overtake in months a head start of years. Key men transported across the country or over oceans in a matter of hours—materials, plans, blueprints on hand when and where needed—these are the contributions of the airlines.

Organized and equipped for normal peacetime traffic, the airlines were abruptly assigned a key role in defense. They accepted the job calmly and without show—training personnel, extending routes, and increasing schedules without relaxing either vigilance or quality of service. No gauge can measure America's debt to the airlines for the thousands of productive hours that otherwise would have been lost forever.

#### **3000 Man-years Saved in 1941**

*For each 100 miles flown, 1 hour and 42 minutes is saved over the next fastest mode of travel. Flying over 1,500,000,000 passenger miles, the airlines have saved 3000 man-years in 1941. Designed to speed traffic is this new Airlines Terminal building in midtown Manhattan.*



**WRIGHT AERONAUTICAL CORPORATION**  
A Division of Curtiss-Wright Corporation • Paterson, New Jersey



# Harvey Plan Inaugurated on West Coast to Spread War Production to Small Shops

## Group Plans to Begin Negotiations for Big Prime Contracts

By JAMES L. STRAIGHT  
West Coast Editor

**A** PLAN for pooling of war manufacturing facilities is being inaugurated in Los Angeles which proponents believe may bring into production hundreds of small machine shops hitherto neglected throughout the nation, and at the same time open to the California aircraft manufacturers a new organized outlet.

The Aircraft Parts Manufacturers Association and Harvey Machine Co. share the credit for originating, at a meeting with the owners of 22 idle Los Angeles machine shops, a plan under which the Harvey Co. proposes immediately to begin negotiations for large prime war contracts. Munitions and ordnance orders will be sought first, with serious interest also in large aircraft subcontracting.

"We are prepared now to negotiate with the government or prime defense manufacturers on contracts far larger than any of us could handle individually," says Lawrence Harvey, head of the firm which will direct the bidding.

"When supplied with blueprints and specifications on a given contract we propose to collect bids from the idle machine shops participating in the 'Harvey plan,' for those portions of the contract which they are equipped to execute. We propose to get them together on a price at which each can make a reasonable profit. It's just a matter of making one big shop out of a lot of helpless competitors, and centralizing all of the paper work.

### Complete Inventories

"We already have complete inventories of facilities available at each of the plants which has joined us so far. We know what each can do, and approximately what their costs should be. Our company will provide engineering, contract supervision and final assembly, along with whatever new tooling may be required. We will participate in the actual machine work only to the extent that our own shop tooling is found necessary.

"The large contract will be sought in our name. We break it down into subcontracts for the greatest possible utilization of all of the facilities in our inventory. We put up the performance bond if one is required. In short, we are the only agency with which the government or prime contractor is concerned."

Harvey believes this is the only means by which the great multitude of small plants in America can sur-

vive the trend to concentrate all large contracts and subcontracts in larger corporations.

"Any idle plant that joins the Harvey plan has everything to gain and nothing to lose. We expect to make work available to them at a mutually satisfactory price. Instead of themselves bidding on individual jobs, they may get the opportunity to secure a continued supply of the type of work they can do best," Harvey said.

### May Answer Problem

According to the Executive Secretary Jack Frost of the Aircraft Parts Manufacturers Association, the cooperative bidding plan may be the answer to problems that have long troubled the government and major war manufacturers, both politically and production-wise. If the first group is successful others will develop, he predicted.

"There are many small machine shops with which the major manufacturers find they simply cannot deal satisfactorily. Hence, although the majors apparently are steadily farming out more and more of their work at the government's request, there are still dozens of small plants that haven't been able to fit in anywhere. The immense sub-contracts tend to go to firms large enough to handle them, and who knows something about defense contract procedures.

"Likewise, there are many small machine shops that have never had any defense work. Most of those who have so far joined in the Harvey plan are in this group."

It is readily admitted by Harvey that this cooperative group could not bid competitively on a price basis with some large individual manufacturer. But with only a slight price advantage along the lines publicized as available through the Office of Contract Distribution, he believes this plan can bring into production an increasing number of small plants that would otherwise remain idle indefinitely.

"All of these small plant owners are experienced machine shop or metal trades men, but not all of them know anything about ordnance or aircraft work. Nor are they engineers. But with competent engineering supervision they can turn out a large volume of work collectively," he added.

"When the Aircraft Parts Manufacturers Association asked for a personal visit from Thurman Arnold, Assistant U. S. Attorney General, this plan of operation was in our minds, prompted by similar operations at York, Pa.

"We gained the impression from him that so long as such a cooperative bidding arrangement is not so large that it eliminates competition in an entire area, there is probably no restraint of trade within the meaning of the anti-trust laws."

The Harvey Co. seemed the logical firm to represent the group of small

shops, because of its diversified shop equipment and long experience in machine engineering. Harvey has no doubt that this group as now set up can efficiently handle prime contracts for munitions or ordnance or for complete aircraft sub-assemblies running into millions of dollars.

"A spreading of this practice of group bidding through one experienced and responsible head will tend to eliminate one of the worst evils of the defense emergency. I refer to the practice of small shops bidding on defense contracts with no knowledge whatever of their costs.

"As government buyers and major manufacturing purchasing agents know, bids on defense sub-contracts have often covered a spread of from 100% to 500%.

### Busman's Holiday

Realizing that most of its employees, like the vast majority of defense workers throughout the country, had never seen, firsthand, how their jobs tie into the defense program, Kinner Motors Inc. arranged for a special demonstration at Ryan School of Aeronautics recently.

Approximately 75% of Kinner's personnel turned out, making up a motor caravan of 30 cars, although the trip involved 180 miles of Sunday driving from Glendale to Ryan's Hemet, Cal. school.

There are always some bids far too high, and some at the lower extreme, due to inexperience with such work.

"The result is that we find some shops making plenty of money for a short while, and others going out of business. One extreme is as bad as the other for the defense program," he asserted.

## Personnel in the News



Holland



Palmer



Colvin



Bailey

The appointment of Wesley Gould Palmer to the position of production manager of Morrow Aircraft Corp. is announced. Palmer spent the last 12 years with Vega, Lockheed and Douglas.

Frank Sinning has been appointed to the post of works manager of Aircraft Components Inc., Van Nuys, Cal., having previously been assistant superintendent of manufacturing at Vega.

Ryan Aeronautical Co. has announced the appointment of Bert Holland as chief inspector, succeeding Mel Thompson who has been named assistant service manager. Holland entered aviation 25 years ago.

William S. Bailey, formerly with Intercontinent Aircraft Corp., recently reported his safe arrival in Rangoon, Burma, where he will continue to work with aircraft for Intercontinent Corp., export affiliate of the Miami company.

Harry D. Bubb of Thompson

Products Inc. has been promoted from chief engineer of the company's Cleveland plant to director of engineering for both the Cleveland unit and Thompson Aircraft Products Co., the \$13,000,000 RPO subsidiary in Euclid, O.

George Tharratt has been made new chief engineer for Adel Precision Products Corp., and Lynn Reynolds, formerly chief engineer, has been named vice president and production manager.

Election of Timothy Colvin as vice president and director of Aircraft Accessories Corp. and his appointment as general manager and sales manager of the company has been announced.

H. H. Budds, general manager of the aviation department of Briggs Manufacturing Co., Detroit, has joined the Ranger Aircraft Engines Division of Fairchild Engine & Airplane Corp., Farmingdale, N. Y., as a production specialist.



Budds



Sinning

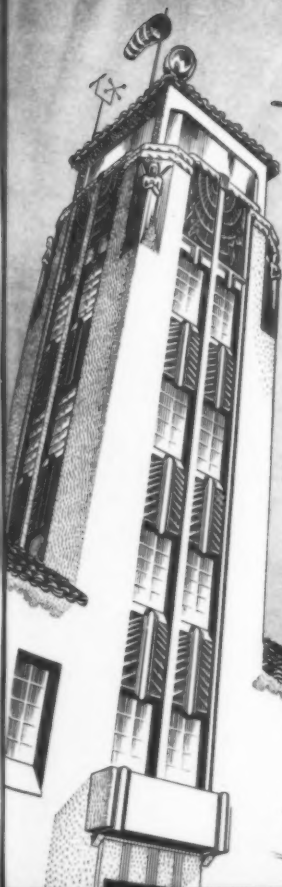


Bubb



Tharratt

# LONG-RANGE TRAINING



... IS AS ESSENTIAL AS  
LONG-RANGE BOMBERS!



CURTISS-WRIGHT TECHNICAL INSTITUTE

THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS • FOUNDED IN 19

THE PUBLIC SCHOOLS are to be commended for the good job they are doing, despite their lack of aviation experience. In turning out large numbers of single-phase workers for the present emergency. The present temporary crisis justifies this expedient. BUT the aircraft industry will not be satisfied with temporary expedients for the future. America's future depends on the long-range training of the men who will design and build these ships, and the value of each man is determined by two factors: his serious purpose in selecting aviation as his life work, and THE ABILITY AND EXPERIENCE OF THOSE WHO TRAIN HIM FOR THAT CAREER. Curtiss-Wright Technical Institute, under the personal supervision of Major C. C. Moseley, President since its inception, and sole owner, is America's most distinguished school specializing in the training of Aeronautical Engineers and Master Aviation Mechanics. Its standing in the industry is attested by its selection by Donald W. Douglas, President of the Douglas Aircraft Company, as the school for

his own son's training. Its accumulated experience of many years in technical aeronautical instruction equips the aviation industry with graduates thoroughly qualified as supervisory personnel and is now being utilized in the National Defense Program by the U. S. Army Air Corps in the training of thousands of enlisted men as Air Corps Mechanics, while its flying affiliates, Cal-Aero Flight Academy, Mira Loma Flight Academy and Polaris Flight Academy, are extending primary and basic training to Flying Cadets of the U. S. Army Air Corps and the Royal Air Force. With a proved and tested curriculum and unsurpassed faculty of practical engineers and technicians, we take great pride in filling the industry's call for men "trained to precise order" . . . the career men on whom aviation's future depends. Curtiss-Wright Tec is now training approximately 2,000 students, of whom approximately 100 are Army enlisted men, and is prepared to expand to accommodate 5,000 students if necessary in the interests of National Defense.



## Entire Output of New Curtiss-Wright Plant Will Go to Navy for Expanded Operations

**C**URTIS-Wright Corp. Airplane Division on Dec. 4—three days before the Japanese attacks in the Pacific—dedicated its new Columbus, O., factory as the first fully-integrated plant working entirely on Navy contracts.

Coinciding with the dedication was the display of the first Columbus-built plane—an SO3C-1 "Seagull," deadly scout observation type, described by the company as the fastest cruiser or battleship-based craft in the world.

### Planes for Pacific War

Company states that the \$14,000,000 Columbus unit is the first major airplane manufacturing plant erected during the present emergency to engage solely in producing new aircraft types. These are the SO3C-1 on which production has already begun, and the newly-developed SB2C-1 "Helldiver" dive bomber, both adapted to the type of naval warfare now raging in the Pacific.

The SO3C-1 is powered by a 12-cylinder Ranger engine, while the



Williams

Vaughn

SB2C-1 utilizes a 1,700-hp. Wright Cyclone. Although, for the present, the entire production of the Columbus plant will go to the Navy, plans are reported under way whereby a version of the Helldiver would be built for the Army.

### Helldiver Output Due in May

Under present plans, the new Columbus factory will begin delivering Helldivers to the Navy next May, and during the same month it will attain peak production of Seagulls.

The new factory, the second of three Curtiss-Wright airplane units to be completed under the expansion program announced in the fall of 1940, comprises approximately 1,300,000 sq. ft. and was erected in 147 days. Now employing over 3,700 persons, it will eventually have 13,000 workers. It supplements a C-W aircraft unit dedicated in Buffalo, N. Y., in August as well as a third plant nearing completion in St. Louis.

J. A. Williams, a veteran in aviation, having joined Curtiss-Wright in 1921, is general manager of the Columbus plant. S. I. Vaughn, factory manager, has been associated with the industry for 33 years. He joined C-W in 1915.

The Columbus plant proper, which incorporates blackout facilities, consists of three directly-linked units

### Erected in 147 Days



C-W Unit Will Concentrate on Navy Planes

of steel, concrete and glass. These are the two-story administration building, 400' x 50'; the two story engineering building, 900' x 100'; and the factory comprising a parts production and assembly building, 600' x 1400', two sub-assembly sections each measuring 600' x 100', and the final assembly bay, 600' x 200'. Architect was Albert Kahn Inc., Detroit.

Upon completion of the St. Louis unit, Curtiss-Wright Airplane Division will have 5,000,000 sq. ft. of floor area in its four factories, including 2,327,908 sq. ft. in its two Buffalo units. This compares with approximately 1,000,000 sq. ft. in mid-1940. The four plants now employ more than 27,000 workers, with the total to reach 50,000 when full production is reached in 1942.

### Supercharger Factory Rising at Fort Wayne; 2 More DPC Loans

GENERAL Electric Co. this month started construction on its \$25,000,000 turbo-supercharger factory at Fort Wayne, Ind., with the project—financed by the Defense Plant Corp.—scheduled to be completed by July 1.

The structure will be one story high, 800 ft. long and 700 ft. wide. The building itself will cost \$8,000,000, the machinery and equipment over \$16,000,000. Approximately 4,000 workers will be required at peak production.

General Electric is now producing turbo-superchargers at Lynn, Mass., with a \$5,000,000 factory almost completed at Everett, Mass.

New Defense Plant Corp. allotments for aircraft facilities declined sharply during the past fortnight, with recent grants as follows: Cleveland Graphite Bronze Co., Cleveland, O., \$1,393,647 for machinery and equipment to be used in the production of aircraft engine bearings.

Otis Elevator Co., New York, N. Y., \$147,567 for machinery and equipment to be used in production of gun turrets for Navy aircraft.

### Electronic Specialty Moves

Electronic Specialty Co. reports moving from Glendale to a new and larger plant at 3456 Glendale Blvd., Los Angeles.

## Bell Aircraft Dispute Goes to Arbitration

BELL AIRCRAFT Corp. and the UAW-CIO early this month submitted to a three-man arbitration board their dispute involving demands for wage increases, modified union shop and the check-off.

The move forstalls a strike at the Buffalo and Niagara Falls plants which would have involved 11,000 workers and affected \$160,000,000 worth of aircraft contracts.

The Bell dispute was the most serious threat to aircraft production during recent weeks. A three-day general strike of machinists which crippled production at Curtiss-Wright and McDonnell aircraft plants in St. Louis ended late last month.

## First Northrop-Built Vengeance Dive Bomber for RAF Produced

NORTHROP Aircraft Inc. has completed its first Vengeance dive bomber (under license from Vultee) for the RAF. The Vengeance is the first plane to be assembled in the Northrop plant since the company designed and built N3PB patrol bombers for the Royal Norwegian Naval Air Force.

In addition to work on the \$34,000,000 dive bomber order, Northrop is building nacelles and cowls for Flying Fortresses and complete tail assemblies for Consolidated Catalina flying boats. The firm will be in production on \$26,000,000 worth of planes of its own design, in addition to Vengeances, in 1942.

Northrop's personnel of over 4,000 is now working on a \$78,000,000 backlog. New hirings are expected to bring the total of workers at the plant to 6,000 early next year.

With the start of production on the Vengeance last month, Northrop expected sharp increases in dollar volume deliveries, thereby continuing the upswing reported during the summer and fall. Shipments of \$320,600 in August climbed to \$372,234 in September and \$610,475 in October. The company plans to reach an output rate of between \$25,000,000 and \$30,000,000 annually in 1942.

## 'Mars' Suffers Mishap In First Water Test

THE MARS, Glenn L. Martin Co.'s 70-ton flying boat, on Dec. 5 was damaged in the first of a series of water tests when the failure of one of her four 2,000-hp. engines started a fire in the housing and threw the plane out of control.

One propeller blade ripped through the ship's side, injuring one man. The blazing engine scorched the plane's coating. Officials said they did not believe there was any possibility of sabotage.

Joseph T. Hartson, executive vice president, indicated there was "no major damage."

## Jouett Elected For 4th Term

COL. JOHN H. JOUETT of Washington was reelected to serve his fourth term as president of the Aeronautical Chamber of Commerce of America, at its annual meeting in New York.

Other officers elected were five vice presidents, P. G. Johnson, Boeing Aircraft Co., Seattle; J. Carlton Ward Jr., Fairchild Engine & Airplane Corp., New York; C. S. Jones, Casey Jones School of Aeronautics, Newark, N. J.; Harrison Brand Jr., Washington; Howard Mingo, Washington; secretary, Irving H. Taylor, Washington; treasurer, Harrison Brand Jr., assistant treasurer, Vincent Ford, Los Angeles; assistant secretary, Stewart J. Moulin, Los Angeles.

Members of the executive committee elected are: Clayton J. Brukner, Waco Aircraft Co.; A. T. Burton, North American Aviation; Frank N. Fleming, Douglas Aircraft Co., Santa Monica, Cal.; J. T. Hartson, Glenn L. Martin Co.; P. A. Hewlett, Vultee Aircraft; Albert I. Lodwick, Lakeland School of Aeronautics; Charles Marcus, Bendix Aviation Corp.; Thomas A. Morgan, Sperry Corp.; James F. Murray, Boeing Aircraft Co.; F. R. Neely, Bell Aircraft Corp.; J. A. B. Smith, Curtiss-Wright Corp.; J. Story Smith, Jacobs Aircraft Engine Co.; S. W. Voorhes, Lockheed Aircraft Corp.; Raycroft Walsh, United Aircraft Corp.; J. Carlton Ward Jr., Fairchild Engine Airplane; H. E. Wellmiller, Consolidated Aircraft Corp.

With the following they comprise the newly elected board of governors: Charles H. Babb, Charles H. Babb Co.; George F. Chapline, Brewster Aeronautical Corp.; LaMotte T. Cohu, Northrop Aircraft; Wallace Kellett, Republic Aviation Corp.; Richard H. Dewey Jr., Taylorcraft Aviation Corp.; John A. Eubank, L. R. Grumman, Grumman Aircraft Engineering Corp.; C. S. Jones; John H. Jouett; Aubrey Keif, The Texas Co.; J. Brooks Parker, Parker & Co.; Wayne Parrish, AMERICAN AVIATION ASSOCIATES Inc.; W. T. Piper, Piper Aircraft Corp.; E. T. Price, Solar Aircraft Co.; Don Smith, Sacramento Municipal Airport; Alfred Wolfe, Aircraft Owners & Pilots Association.

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Pilot



R. Wicks

# Teamwork

AS North American patriotically points out, *Teamwork* in Aviation will bring Victory. ADEL DESIGN SIMPLICITY assures *Teamwork* between ADEL Technicians and Engineers thruout the Industry—*Teamwork* in expediting production coordination—*Teamwork* thru simplified field servicing and maintenance—*Teamwork* thru consistent and dependable operation from the Arctic to the Tropics.

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**N**orth American Aviation, Inc. has been dedicated to national defense since its birth. In this emergency its responsibilities are as direct and vital as those of the military forces. In the line of production duty, North American engineers pioneered the breakdown of bulky airplane components into small assemblies, thus permitting extensive sub-contracting of such parts and assemblies. So today we take pride in saluting 921 sub-contractors throughout the nation who are making a mighty contribution to the all-out production of North American Bombers, Fighters and Trainers.

*J. H. Kincaid* President

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BELOW IS THE HONOR ROLL of 921 firms who in production of parts, materials and sub-assemblies for Working as a team, their cooperative efforts insure their hundreds of thousands of employees go the prize

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Alaroot Mfg. Company  
Alley Nick Room Supply Co.  
Abbott Bros.  
Abbott Laboratories  
Abco Metalcraft Company  
Abe & Reinhold Co., Ltd.  
Abrasive Sales & Service Co.  
Ace Sheet Metal Works  
Ace Stamp & Stencil Co.  
Ace Tool & Engineering, Inc.  
Acme Bag & Twine Company  
Acme Blower & Pipe Co.  
Acme Electric Welder Co.  
Acme Kling Tite Company  
Acme Metal Die & Stencil Works  
Acme Pattern & Foundry Co.  
Acme Saw Works  
Acme Steel Company  
Acme Wiping Rag Company  
Adams & Riddle  
Addressograph Company  
Adol Precision Products  
Adler Brush Mfg. Company  
Advance Paper Box Co.  
Advance Saw Works  
Aero Corporation  
Aero Alloy Inc.  
Aero-Coupling Corporation  
Aero Electric Corporation  
Aero Anaco Corporation  
Aero Associates, Inc.  
Aero Research Manufacturing Co.  
Aircraft Accessories Corp.  
Aircraft Industries, Inc.  
Aircraft Plating Company  
Aircraft Precision Products, Inc.  
Aircraftmen, Inc.  
Aircraft Specialties Corp.  
Aircraft Tool & Supply Co.  
Aircraft Tool, Inc.  
Air Reduction Sales Co.  
Airsun Company  
Airmite Lubricator Co.  
Alhambra Foundry  
Alliency Ludlum Steel Corporation  
Allied Industries, Inc.  
Allied Supply Company  
Allis Chalmers Mfg. Co.  
Alloy Steel & Metals Co.  
Alco, A. S. Company  
Aluminum Alloy Castings Co.  
Aluminum Co. of America  
American Aircraft Radio Co.  
American Brass Company  
American Cable Company  
American Can Company  
American Concrete & Steel Pipe Company  
American Cyanamide & Chemical Company  
American Forge Company  
American-La France & Foamite Corp.  
American Paper Company  
American Saw & Knife Works  
American Seating Company  
American Window Glass Company  
Anchor Packing Company  
Anchor Post Fence Co. of California  
Andrews Hardware & Metal Company  
Angelus Steel Treating Co.  
Angelus Sanitary Can Co.  
Angelus Paper Box Co.  
Automatic Vise Sales Co.  
Arrowhead Rubber Company  
Arrow Brass Foundry, Inc.  
Atlas Plating Company  
Austin Company, The  
Atebison, Toronto & Santa Fe Railway  
Aviation Parts, Inc.  
Aviation Supply Company  
Baash-Ross Tool Company  
Baker Oil Tools, Inc.  
Bakewell Mfg. Company  
Barnard Engineering Co.  
Bay Cities Typewriter Shop  
Bemis Bros. Bag Company  
Berlin & Russell  
Berry Bros.  
Best, Jack, Mfg. Company  
Binks Mfg. Company  
Blackman, H. F. Machine Co.  
Braun Corporation

California Gauge & Equipment Company  
California Spring Co., Inc.  
California Steel Treating Co.  
California Wholesale Electric Company  
California Wire Cloth Co.  
Cannon Electric Company  
Carbide & Carbon Chemicals Corp.  
Carliorandum Company  
Cash Wholesale Tobacco Company, Inc.  
Central Stationery & Printing Company  
Century Metalcraft Mfg. Co.  
Chandler & Lyons Stores, Inc.  
Chase Brass & Copper Co., Inc.  
Chicago Pneumatic Tool Co.  
City Wire & Iron Works  
Clark, C. N. Iron Works  
Clark Tractor  
Cleveland Pneumatic Tool Company  
Coast Centerless Grinding Co.  
Collins-Powell Company  
Colson Equipment & Supply Company  
Columbia Steel Company  
Commercial Iron Works  
Compton Metals, Inc.  
Consolidated Aircraft Corp.  
Consolidated Steel Company  
Cook Heat Treating Corp.  
Cork Insulation Co.  
Crane Company  
Dearborn Chemical Co.  
Die Cast Corporation  
Dietrich-Potter Company  
Dietzen, Eugene Co.  
Dill Manufacturing Co.  
Ditto Sales & Service Agency  
Dix Relay Company  
Doak Aircraft Co., Inc.  
Draver & Hansen, Inc.  
Ducommun Metals & Supply Company  
Eastman Kodak Company  
Eccles & Davies Machine Co., Inc.  
Economy Blue Print Co.  
Electric Vacuum Cleaner Co., Inc.  
Emaco Asbestos Company  
English & Laner  
Essig Company, Ltd.  
Fairair Bearing Company  
Fairbanks Morse & Company  
Farrar Industrial Products Company  
Fearless Camera Co., Inc.  
Federal Bearings Co., Inc.  
Felt & Tarrant Mfg. Co.  
Fireboard Products, Inc.  
Fischer, Chas. Spring Co.  
Firestone Tire & Rubber Co.  
Fies-D-Tube Co.  
Foamite-Childs Corp. of California  
Formex Insulation Co., Inc.  
Frese, Adolph, Corp.  
Frey Industrial Supply Co.  
Fuller, W. P. & Company  
Fulton Siphon Company  
Fye-Pyter California Co.  
Garlock Packing Company  
Garrett Supply Company  
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General Chemical Company  
General Electric Company  
General Fireproofing Co.  
General Metals Corporation  
Giffman Bros., Inc.  
Gillette Machine & Tool Co.  
Giddens Co.  
Goddard-Jackson Company  
Gould Storage Battery Corp.  
Graham-Beynolds Electric Co.  
Graybar Electric Company  
Grimes-Stansforth Stationery Company  
Haas-Baruch & Company  
Haidson, A. Company  
Hadley, Chas. R. Company  
Hammond Lumber Company  
Harron, Richard & McCone Company  
Hartwell Aviation Supply Co.  
Hartwell, Robt. N. Co.  
Harvill Aircraft Die Casting Corp.

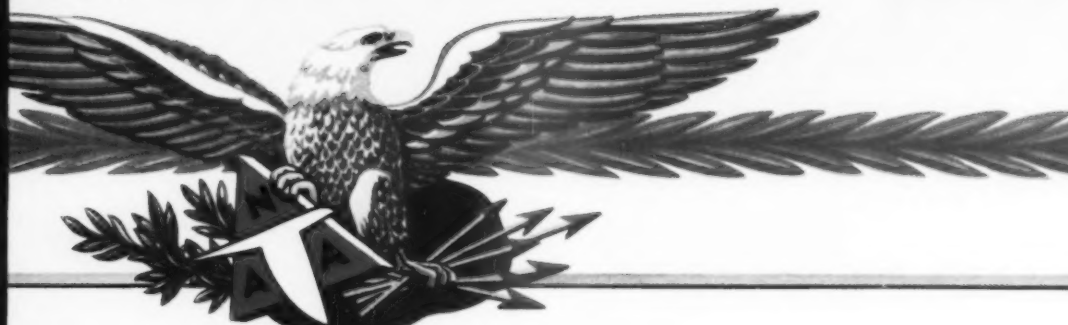
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Holler-Selzer Company  
Holtzner Cold Spring Mfg. Co.  
Hoover Ball and Bearing Co.  
Independent Pneumatic Tool Company  
Ingersoll-Rand Company  
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Ingram Paper Company  
International Business Machines Corporation  
Interstate Aircraft & Engineering Company  
Irving Air-Chute Co., Inc.  
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Joalin Lumber Company  
Jamison Steel Corporation  
Jeffries Transformer Co.  
Johns-Manville Company  
Jones, Frank E. Machinery Corp.  
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Joalin Lumber Company  
Kennedy Name Plate Co.  
Keystone Tool & Supply Co.  
Keystone Engineering Co.  
Keuffel & Esser Co.  
King, Irving G. & Co.  
Kinney Aluminum Company  
Kinney Iron Works  
Kirkhill Rubber Company  
Kirk, Morris F. & Son  
La Moore, C. D.  
Latex Seams Products L & F Machine Company  
Leach Chemical Company  
Leach Relay Company  
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Leahy, Dave of Calif., Inc.  
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Libbey-Owens-Ford Glass Co.  
Lights, Inc.  
Linde Air Products Co.  
Listenswelter & Gough, Inc.  
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Los Angeles Desk Company  
Los Angeles Fireproof Door Company  
Los Angeles Heavy Hardware Company  
Los Angeles Ladder Co.  
Los Angeles News Company  
Los Angeles Parkizing Co.  
Los Angeles Stamp & Stationery Company  
Machinery Sales Company  
Machinists' Tool & Supply Company  
Madull, Inc.  
Magnesium Products, Inc.  
Mallory, Edw. D. Co.  
Mallory, P. E. & Co.  
May Company, The  
McKesson & Robbins, Inc.  
McKinney Blue Print Corp.  
McMahon Bros.  
Mechanical Foundries, Inc.  
Mefford Chemical Company  
Mellus Bros. & Co., Inc.  
Meyer Machinery Company  
Mid-State Company  
Miller-Bryant-Pierce Co.  
Mills Iron Works, Inc.  
Minnesota Mining & Mfg. Co.  
Modern Die & Stamping Co.  
Modern Plating Co.  
Moore Machinery Co.  
National Carbon Co., Inc.  
National Carloading Corp.  
National Dry-Ice Corp.  
National Lead Company  
New Plastics Corporation  
New Departure Mfg. Co.  
Oakite Products, Inc.  
Omsted Mfg. Company  
Osborne, Raymond G. Co.  
Owens-Parks Lumber Co.  
Pacific Abrasive Supply Co.  
Pacific Aviation Inc.  
Pacific Automotive Corp., Ltd.  
Pacific Ball Bearing Co.

Pacific Bearings Company  
Pacific Coast Brush Co.  
Pacific Cut Washer Co.  
Pacific Fire Extinguisher Co.  
Pacific Hide & Leather Co.  
Pacific Machine Tool Co.  
Pacific Manufacturing Co.  
Pacific Metals Co., Ltd.  
Pacific Pump Works  
Pacific Scientific Company  
Pacific Screw Products Co.  
Patterson-Blinn Lumber Co.  
Paula Plastics Company, H.  
Peterson, F. Somers Co.  
Pierson Machine Company  
Phillips, Wm. E. Company  
Piont Tool Mfg. Company  
Plumbing & Heating Supply Company  
Plowey Mfg. Company  
P.R.S. Tool & Mfg. Co.  
Pitney-Bowes Postage Meter Company  
Poulsen & Narden Tool & Die Works  
Product Engineering Co.  
Pure Carbonic, Inc.  
Purulator Products, Inc.  
Pyrene Mfg. Company  
Pyroil Co. of Los Angeles  
Quality Electric Co., Ltd.  
Radio Products Sales Co.  
Radio Supply Company  
Radio Television Supply Co.  
Remington-Rand, Inc.  
Rickensacker Mfg. Company  
Rocky Mt. Steel Products, Inc.  
Roebeling's, J. A. Sons Co. of California  
Rogers Pattern & Foundry Co.  
Rubbercraft Corp. of Calif.  
Ruschell Mfg. Company  
S. & M. Lamp Company  
Santa Fe Pipe & Supply Co.  
Schatz Venetian Blind Co.  
Schneider's, A. Sons  
Schrillo Tool & Engineering Company  
Sewabacher-Frey Company  
Schwein Company, L. N.  
Seaboard Coil Spring Corp.  
Sears-Robuck & Company  
Sherwin-Williams Co. of California  
Simonds Saw & Steel Co.  
Simplex Rubber Stamp Div.  
Singer Sewing Machine Co.  
Sierra Rubber Company  
Sierra Sanitary Mfg. Co.  
S.K.F. Industries, Inc.  
Smith Bros. Truck Co.  
Smith-Emery Company  
Snap-on Tool Corporation  
Solitzer, E. L. Company  
Solar Aircraft Safe Co.  
Southern California Bag Co.  
Southern California Disinfecting Co.  
Southern California Gas Co.  
Southern California Foundry  
Southern California Safe Co.  
Southern Calif. Stationers  
Southern California Telephone Co.  
Southern Pacific Railroad  
Southern Railway Supply Company  
Sparklets Drinking Water Corporation  
Spray Gun Sales & Service Company  
Stanton D. Company, Inc.  
Stationers Corporation  
Standard Felt Company  
Standard Fence Company  
Standard Oil Company of California  
Steel Products Eng. Co.  
Sterling Electric Motors, Inc.  
Sullivan Fence Company

Sun Lumber Company  
Sutorbit Corporation  
Sveinow, Davo, Corp.  
Swift & Company  
Technical Products Co., Inc.  
Texas & Pacific Railroad Co.  
Thackaberry, M. C.  
Thompson Glass & Paint Co.  
Pacific Pump Works  
Tibbets-Westernfield Paint Company  
Toll Sales Company, The  
Toll Mechanical Works  
Trulove's Transfer Turco Products, Inc.  
Underwood-Elliott-Fisher Co.  
Union Hardware & Metal Co.  
Union Pacific Railroad  
Union Transfer & Storage Co.  
United Motors Service, Inc.  
United States Bag & Supply Company  
United States Flexible Metallic Tubing Co.  
United States Gauge Co.  
Universal Carloading & Distributing Company  
Utility Electric Steel Foundry  
Victor Belting & Rubber Co.  
Victor Welding Equipment Company  
Viking Pump Company  
Vogue Composition Co.  
Wabash Railway Company  
Wallace, J. D. & Company  
Wardrobe Ligon Supply Co.  
Warman Steel Foundry  
Warner & Swasey Company of California  
Warren & Bailey Company  
Wagner Electric Corporation  
West Disinfecting Company  
Western Auto Supply Co.  
Western Electric Company  
Western Galvanizing Co.  
Western Hardware Lumber Company  
Wiley Machine Co., Inc.  
Wilson Paper Company  
Westinghouse Electric Co.  
Wolverine Tube Company  
Yeom, Sam  
Zellerbach Paper Company  
Zonne Electric Tool Co.

Seamless Rubber  
Stanley Works, Inc.  
Sewell Manufacturing  
Tornton Co., Inc.  
United Aircraft Corp. Division  
Veedor-Root, Inc.  
Vought-Sikorsky  
DELAWARE  
National Vulcan  
Wilmington Fibre  
Specialty Com  
ILLINOIS  
Automatic Screw  
Products  
Abbott Laboratories  
Acme Industrial  
Acme Steel Company  
Adjustable Clamp  
American Chain  
American Automobile  
American Phenol  
American Stock  
Armstrong Bros.  
Arens Controls  
Automatic Screw  
Askanian Regulator  
Bastian-Blessing  
Bauer & Black  
Barter-Colman Co.  
Belden Mfg. Co.  
Besley, Chas. H.  
Binks Manufacturing  
Boshman Aero Mfg.  
Burgess, C. F. La  
Chicago & North  
Chicago Metal He  
Chicago, Milwaukee  
St. Paul Railro  
Chicago Rock Isl  
Chicago Screw Co.  
Correll Forge Co.  
Crane Company  
Dearborn Chemi  
Dietzen, Eugene  
Fairbanks Morse  
Felt & Tarrant M  
Geartner Scientific  
Ideal Commutator  
Dresser Co.  
Illinois Central R  
Independent Pneu  
Tool Co.  
Jones, Howard B  
Jefferson Electric  
Kropf Forge Com  
Krelling Switch  
Supply Co.  
Lenz Electric Co.  
L'Hommedieu, Ch  
& Sons Co.  
Littlefield Labor  
Leonard, G. R. &  
Lange, Henry G.  
Wicks  
Lincoln Schleuter  
Mach. Co.  
Mansure, E. L. &  
Magnatux Corp  
Micro Switch Corp  
Miller-Bryant-Pie  
Omsted Mfg. Co.  
Onsduke Machine  
Pyle National Co.  
Pinehill Mfg. Co.  
Quicklock Co.  
Hunzel Cord & W  
Ryerson, J. T., &  
Seaman Paper Co  
Shaffer Bearing Co  
Stewart-Warner C  
Steel Sales Corp.  
Shakeproof Lock  
Selaky Spud Weld  
Speedway Mfg. Co  
Stewart Die Cast  
Whitney Metal To  
Wittek Manufactu  
INDIAN  
Adams & Westla  
Allison Engineer  
Aluminum Co. of

...TO BUILD WITH TEAMWORK IS



# All to Victory in the Battle of Production

THE HONOR ROLL of 921 firms who have enlisted in national defense by their record parts, materials and sub-assemblies for North American Bombers, Fighters and Trainers. Their cooperative efforts insure victory in the Battle of Production. To them and to thousands of employees go the praise and gratitude of North American Aviation, Inc.

Sun Lumber Company  
Sutorbilt Corporation  
Swedlow, Dave, Corp.  
Swift & Company

Technical Products Co., Inc.  
Texas & Pacific Railroad Co.  
Thackaberry, M. C.  
Thompson Glass & Paint Co.  
Tibbitts-Westerfield  
Paint Company  
Todd Sales Company, The  
Toller Mechanical Works  
Trulove's Transfer  
Turco Products, Inc.

Underwood-Elliott-Fisher Co.  
Union Hardware & Metal Co.  
Union Pacific Railroad  
Union Transfer & Storage Co.  
United Motors Service, Inc.  
United States Bar &  
Supply Company  
United States Flexible  
Metallic Tubing Co.  
United States Gauge Co.  
Universal Cartloading &  
Distributing Company  
Utility Electric Steel Foundry

Victor Belting & Rubber Co.  
Victor Welding Equipment  
Company  
Viking Pump Company  
Vogue Composition Co.

Wabash Railway Company  
Wallace, J. D. & Company  
Wardrobe Lumber Supply Co.  
Warman Steel Foundry  
Warner & Swasey Company  
of California  
Warren & Bailey Company  
Warner Electric Corporation  
West Disinfecting Company  
Western Auto Supply Co.  
Western Electric Company  
Western Galvanizing Co.  
Western Hardwood  
Lumber Company  
Wiley Machine Co., Inc.  
Wilson Paper Company  
Westinghouse Electric Co.  
Wolverine Tube Company

Yocum, Sam

Zellerbach Paper Company  
Zonne Electric Tool Co.

**ALABAMA**  
Ingalls Iron Works  
Kilby Car & Foundry Co.

**CONNECTICUT**  
American Brass Company  
American Metal Hose Co.  
American Tube Bending Co.  
Billings & Spencer Co.  
Bronson, Homer D., Co.  
Corbin Screw Co.  
Cuno Engineering Corp.  
Cott's Patent Fire Arms  
Mfg. Co.  
Chance-Vought Aircraft Co.  
Chandler-Evans Co.  
Chase Brass & Copper  
Co., Inc.  
Eastern Machine Screw Corp.  
Fafnir Bearing Co.  
Hamilton Standard  
Propeller Division  
Landers-Frary-Clark  
Laminated Shim Co., Inc.  
Lewis Engineering Co.  
Manning, Maxwell &  
Moore, Inc.  
New Denature Mfg. Co.  
Norma Hoffman Bearings  
Corp.  
Pratt & Whitney Aircraft  
Division  
Rockwell Products Corp.  
Stanley Insulating Co.

Seamless Rubber Company  
Stanley Works, The  
Scovill Manufacturing Co.  
Torrington Co., The  
United Aircraft Corp.,  
Exp. Division  
Vendor-Root, Inc.  
Vought-Sikorsky Aircraft Div.

**DELAWARE**  
National Vulcanized Fibre Co.  
Wilmington Fibre  
Specialty Company

**ILLINOIS**  
Automatic Screw Machine  
Products  
Abbott Laboratories  
Acme Industrial Co.  
Acme Steel Company  
Adjustable Clamp Co.  
American Chain & Cable Co.  
American Automatic Elec.  
Sales Co.  
American Phenolic Corp.  
American Stock Gear Co.  
Armstrong Bros. Tool Co.  
Arona Controls  
Automatic Screw Products  
Askanis Regulator Co.  
Bastian-Blessing  
Bauer & Black  
Barber-Colman Company  
Belden Mfg. Company  
Besley, Chas. H., & Co.  
Binks Manufacturing Co.  
Blonham Aero Mfg. Co.  
Burgess, C. F. Laboratories  
Chicago & North Western R.R.  
Chicago Metal Hose Corp.  
Chicago, Milwaukee &  
St. Paul Railroad  
Chicago Screw Company  
Cornell Forge Company  
Crane Company  
Dearborn Chemical Co.  
Dietzgen, Eugene Co.  
Fairbanks Morse & Co.  
Felt & Tarrant Mfg. Co.  
Gaerter Scientific Corp.  
Ideal Commutator  
Dresser Co.  
Illinois Central Railroad  
Independent Pneumatic  
Tool Co.  
Jones, Howard B., Co.  
Jefferson Electric Co.  
Kropf Forge Company  
Kellogg Switchboard  
Supply Co.  
Lenz Electric Co.  
L'Hommedieu, Chas. F.  
& Sons Co.  
Littlefuse Laboratories  
Leonard, G. R. & Co., Inc.  
Lange, Henry G., Machine  
Works  
Lincoln Schleuter Floor  
Mach. Co.  
Mansure, E. L. & Co.  
Magnaflex Corporation  
Micro Switch Corp.  
Miller-Bryant-Pierce Co.  
Omrite Mfg. Co.  
Onsrude Machine Co.  
Pyle National Co., The  
Pheoli Mfg. Co.  
Quickwork, Co., The  
Ramsell Cord & Wire Co.  
Ryerson, J. T., & Son, Inc.  
Seaman Paper Co.  
Shafer Bearing Corp.  
Shakeproof Lock Washer Co.  
Sealy Spot Welder Co.  
Speedy Mfg.  
Stewart Die Casting Div.  
Whitney Metal Tool Co.  
Wittek Manufacturing Co.

**INDIANA**  
Adams & Westlake  
Allison Engineering Co.  
Aluminum Co. of America

Dendix Products Division,  
South Bend  
Chicago Telephone &  
Supply Co.  
Delco-Remy Division  
Diamond Chain & Mfg. Co.  
Electronics Laboratories, Inc.  
Mallory, P. H. & Co.  
Staley Mfg. Corporation  
Yaxley Mfg. Co.

**KANSAS**  
Aircraft Steel and Supply Co.

**KENTUCKY**  
American Air Filter Co.  
Reynolds Metals Co.

**LOUISIANA**  
Cuban-American Sponge Co.  
Louisiana & Arkansas R.R.  
Wellington Sear Co.

**MARYLAND**  
Anchor Post Fence Co.  
Bendix Radio Corp.  
Engineering & Research  
Hovess, S. M. Co.  
Griffith, W. C.  
Hibline, J. Edw. Co.

**MASSACHUSETTS**  
Amesbury Metal Products  
Aerovox Corp.  
Anthony Machine &  
Electric Works  
Boston Auto Gauge Co.  
Boston Insulated Wire &  
Cable Co.  
Boston Gear Works  
Bowers, S. M. Co.  
Kelly, George J., Inc.  
Lundquist Tool & Mfg. Co.  
Moore Drop Forging Co.  
Relief Printing Corp.  
Thomson, Judson L.,  
Mfg. Co.  
United Car Fastener Corp.  
U. S. Automatic Box  
Machinery Co.  
Vulcan Electric Co.  
Vellumold Co., The

**MICHIGAN**  
Aerogrip Corporation  
Ampec Mfg. Co.  
Armstrong, J. W. & Co.  
Beecher, Peck & Lewis  
Berry Bros.  
Bohn Aluminum Co.  
Chandler-Groves Co.  
Chrysler Corp.  
Continental Motors Corp.  
Commonwealth Brass Co.  
Detroit Steel Products Co.  
Douglas, H. A. Mfg. Co.  
Dow Chemical Co.  
Es-Cello Corp.  
Eaton Mfg. Company  
Electric Auto-Lite Company  
Flex-O-Tube Company  
Fisher Body Works  
Gregory Mayer & Thom Co.  
General Motors Corp.  
Gairing Tool Co.  
Hayes Industries, Inc.  
Hydraulic Brake Co.  
Hall, C. M., Lamp Co.  
Koebel Diamond Tool Co.  
Michigan Seamless Tube Co.  
Neilson Chemical Co.  
Rusgreen Mfg. Co.  
Ray Day Piston Corporation  
Soss Manufacturing Co.  
Shakespeare Products Co.  
Shaw-Witling Co.  
Sterling Products  
Stinson Aircraft Corp.  
Tomkins-Johnson Co.  
Udylite Company  
Automatist Corp.  
Vickers, Inc.  
Whitman & Barnes, Inc.  
Wolf Detroit Envelope Co.  
Warner Aircraft Corp.

**MINNESOTA**  
Continental Machine  
Dayton Rogers Mfg. Co.

**MISSOURI**  
Aircraft Instrument Co.  
Baker-Lockwood Co.  
Bettes, A. O. Mfg. Co.  
Builders Steel Co.  
Bussman Manufacturing Co.  
Curtiss-Wright Airplane Co.  
Dierks & Sons  
Elfeldt Hardware &  
Machinists Supply Co.  
English Bros. Machinery Co.  
Faeth Co., The  
Gateway Chemical Co.  
Inman Powell Co.  
Kansas City Southern R.R.  
Langdon Supply Co.  
LaRue Printing Co.  
Liespner, H. C. & Co.  
McKesson & Faxon Drug Co.  
Missouri & Arkansas R.R.  
Missouri Pacific Railroad  
Precision Screw Machine  
& Mfg. Co.  
Ray-D-Vac Company  
Richards & Conover  
Hardware Co.  
St. Louis & San Francisco  
Railroad  
Schooler Printing and  
Stationery Co.  
Seawall Paint Co.  
South-West News Co.

**NEW JERSEY**  
Aircraft Radio Corp.  
Air Cruisers Inc.  
Air Associates Inc.  
Aluminum Co. of America  
American Gas Accumulator  
Company  
American Oil & Supply Co.  
Breeze Corp.  
Burnard Mfg. Corp.  
Celluloid Corp.  
Coast Cable Co.  
Curtiss-Wright Corp.  
Dunlop, Wm. G., Co.  
Dupont, E. I. De Nemours  
Company, Inc.  
Elastic Stop Nut Corp.  
Eclipse Aviation Div.  
General Ceramics Co.  
Groov-Pin Corp.  
Heisenman Electric Co.  
Isolantite, Inc.  
Kaufman & Esser Co.  
Kiddie, Walter & Co., Inc.  
Magnus Chemical Co., Inc.  
Martin-Rockwell Corp.  
National Lock Washer Co.  
Pioneer Instrument Div.  
Pyrene Mfg. Co.  
Pollak Mfg. Co.  
Roebbling's, J. A. Sons Co.  
Roller-Bearing Co. of  
America  
Switlik Parachute &  
Equip. Co.  
Titolok Corp.  
Titebond Metal Hose Co.  
West Jersey Paper Mfg. Co.  
Worthington Pump &  
Mach. Corp.  
Wright Aeronautical Corp.  
Western Electrical  
Instrument Company

**NEW YORK**  
Aero Spark Plug Co., Inc.  
Aerial Machine & Tool Co.  
Aluminum Co. of America  
American Cord &  
Webbing Company  
American Hard Rubber Co.  
Air Reduction Sales Co.  
American Motor Products  
American Can Company  
Anemostat Corp.  
American Cyanamid &  
Chemical Co.  
Armstrong, W. S. Co.  
Air-Maze Air Filter Corp.  
Foamite Corp.  
Ashwell, Thomas & Co.  
Atlantic-Pacific Mfg. Corp.  
Bell Aircraft Corp.

Bendix-Export Corp.  
Blumenthal, Sidney & Co.  
Bowen Products  
Brewster Aeronautical Corp.  
Cambridge Inst. Co.  
Cameron, R. W. & Co., Inc.  
Clarostat Mfg. Co., Inc.  
Calcuttograph Company  
Carbide and Carbon  
Chemicals Corporation  
Corning Glass Works  
Carborundum Company  
Crucible Steel Company  
Chicago Pneumatic Tool Co.  
Columbia Steel Corporation  
Cork Insulation Company  
Curtiss Propeller Division  
Dunlop Tire & Rubber Co.  
Haus Fastener Co.  
Eastman Kodak Company  
Endicott Forging & Mfg.  
Co., Inc.  
Edo Aircraft Corp.  
Fischer, Chas., Spring Co.  
Fairchild Aerial Camera Corp.  
Federal Bearings Co., Inc.  
Gould Storage Battery Corp.  
Carlock Packing Company  
General Chemical Company  
Graybar Electric Company  
General Electric Company  
Harrison Radiator Corp.  
Henry Forge & Tool, Inc.  
Hewitt Rubber Corp.  
Houser Engineering Corp.  
Hunter Sash Company  
Ingersoll-Rand Company  
Ideal Clamp Mfg. Co., Inc.  
International Nickel Co., Inc.  
International Standard  
Electric Corp.  
International Business  
Machines Corp.  
International Projector Corp.  
Irving Air Chute Co.  
Jaeger Watch Co., Inc.  
Johns-Manville Company  
Kemp, W. H. Company  
Kollman Instrument Co.  
Kirkman Engineering Corp.  
Liberty Accessories Corp.  
Leak Developments, Inc.  
Liquimeter Corp.  
Linde Air Products Co.  
Linder, David & Sons, Inc.  
McGraw-Hill Publishing Co.  
McKesson & Robbins Inc.  
Mercury Aircraft Inc.  
Mill Factor Products Co.  
National Carbon Co., Inc.  
New York Central Railroad  
Numbers Stamp & Tool Co.  
National Lead Company  
Oakite Products, Inc.  
Parker-Kalon Corp.  
Roll-Label Manufacturing Co.  
Rosen, A. V. & Co.  
Ra-Ce Tool & Metal  
Stamp Co., Inc.  
Ranger Engineering Corp.  
Rolled Metal Sections Co.  
Reinhold Publishing Corp.  
Simmonds Accessories, Inc.  
Scintilla Magneto Co., Inc.  
Scrieser Tool & Mfg. Co.  
Standard Gauge Co.  
Stimpson, Edwin B. Co.  
Stewart-Hartshorn Co.  
Spiritt Corporation  
Star Machine Mfgs., Inc.  
Shore, The Mfg. Co.  
Sherry Gyroscope Co., Inc.  
Telephonics Corp.  
Thomas Publishing Co.  
United Aircraft Corp.  
U. S. Steel Corp.  
U. S. Gauge Co.  
Vanderbilt, R. T. Co., Inc.  
Wales Dove-Hermiston Corp.  
Williams, J. H. & Co.  
White, S. S. Dental Mfg. Co.  
Western Union Co., Inc.  
Waldorf Mechanical  
Laboratories  
Warren McArthur Corp.

WORK IS THE NORTH AME

# Production

Export Corp.  
 J. L. Sidney & Co.  
 Products  
 Aeronautical Corp.  
 Inc. Co.  
 R. W. & Co., Inc.  
 Mfg. Co., Inc.  
 and Carbon  
 Corporation  
 Glass Works  
 Lum Company  
 Steel Company  
 Pneumatic Tool Co.  
 Steel Corporation  
 Iation Company  
 repeller Division  
 re & Rubber Co.  
 er Co.  
 Kodak Company  
 Forging & Mfg.  
 Co.  
 raft Corp.  
 Chas., Spring Co.  
 Aerial Camera Corp.  
 Bearings Co., Inc.  
 rage Battery Corp.  
 acking Company  
 poration  
 echnical Company  
 Electric Company  
 Electric Company  
 rage Battery Corp.  
 radiator Corp.  
 re & Tool, Inc.  
 lber Corp.  
 Engineering Comp.  
 sh Company  
 Hand Company  
 up Mfg. Co., Inc.  
 nal Nickel Co., Inc.  
 nal Standard  
 Corp.  
 nal Business  
 es Corp.  
 nal Projector Corp.  
 Chute Co.  
 telt Co., Inc.  
 ville Company  
 H. Company  
 Instrument Co.  
 Engineering Corp.  
 cesories Corp.  
 uments, Inc.  
 ter Corp.  
 Products Co.  
 vid & Sons, Inc.  
 ul Publishing Co.  
 & Robbins Inc.  
 ircraft Inc.  
 Products Co.  
 Carbon Co., Inc.  
 Central Railroad  
 Stamp & Tool Co.  
 ead Company  
 oration  
 ducts, Inc.  
 on Corp.  
 Manufacturing Co.  
 W. & Co.  
 & Metal  
 Co., Inc.  
 Engineering Corp.  
 al Sections Co.  
 ublishing Corp.  
 Accessories, Inc.  
 aceto Co., Inc.  
 ol & Mfg. Co.  
 auge Co.  
 Edwin B. Co.  
 rtahorn Co.  
 poration  
 ne Mfgs., Inc.  
 Mfg. Co.  
 ascone Co., Inc.  
 s Corp.  
 blishing Co.  
 f. Co.  
 raft Corp.  
 Corp.  
 e Co.  
 R. T. Co., Inc.  
 -Hermiston Corp.  
 H. & Co.  
 Dental Mfg. Co.  
 B. Co., Inc.  
 echnical  
 ries  
 Arthur Corp.  
**OHIO**  
 aph Co.  
 ment Co.  
 ir Filter Corp.  
 Co. of America  
 ne & Tool Co.  
 andrubber Co.  
 Co.  
 The

Avon Tool & Machine Co.  
 Baltimore-Ohio Railroad  
 Buckeye Portable Tool Co.  
 Cincinnati Machine &  
 Supply Co.  
 Cincinnati Time Recorder Co.  
 Champion Machine &  
 Forge Co.  
 Chesapeake & Ohio Railroad  
 Columbus Metal Products,  
 Inc.  
 Consolidated Mfg. Co.  
 Cleveland Pneumatic Tool Co.  
 Continental Carbon, Inc.  
 Dayton Mfg. Co.  
 Dill Mfg. Co.  
 Diebold Safe & Lock Co.  
 Electric Vacuum Cleaner  
 Co., Inc.  
 Federal Machine &  
 Welder Company  
 Firestone Tire & Rubber Co.  
 Formica Insulation Co., Inc.  
 Frigidaire Corp.  
 Fyr-Fyter Corp.  
 General Tire & Rubber Co.  
 Goodrich, The B. F. Co.  
 Goodyear Tire & Rubber  
 Co., Inc.  
 Goggie, The Parts Co.  
 Grimes Mfg. Co.  
 Husband Aircraft  
 Specialties, Inc.  
 Hansen Manufacturing Co.  
 Hyland Machine Co.  
 International  
 Flare-Signal Co.  
 Koehler Tool & Mfg. Co.  
 Kline Mfg. Company  
 Lincoln Electric Company  
 Leece Neville Co.  
 Lear Aviation Co.  
 Lamson & Sessions Co., The  
 Libbey-Owens-Ford  
 Glass Co.  
 Monmouth Products Co.  
 Moore Eastwood & Co.  
 Marquette Metal Products Co.  
 National Bronze &  
 Aluminum Co.  
 Ohio Seamless Tube Co.  
 Packard Electric Co.  
 Parker Appliance Co.  
 Pump Engineering  
 S. A. E. Steels  
 Service Tool &  
 Engineering Co.  
 Standard Aircraft  
 Products, Inc.  
 Steel Products  
 Engineering Co.  
 Timken Roller Bearing Co.  
 U. S. Rubber Products, Inc.  
 Van Dorn Iron Works  
 Variety Aircraft Corp.  
 Weatherhead Co., The  
 Weldon Tool Co., The  
 Western Automatic  
 Machine Screw Co.

## OKLAHOMA

Macklanburg-Duncan Co.

## OREGON

Pacific Spruce Company

## PENNSYLVANIA

Aero Supply Mfg. Co., Inc.  
 Aluminum Co. of America  
 Allegheny Steel Co.  
 American Chemical Paint Co.  
 American Window Glass Co.  
 American Cable Co.  
 Anchor Packing Co.  
 Bond, Chase Co.  
 Budd, Ed. G. Mfg. Co.  
 De Sanno, A. P. & Son, Inc.  
 Diaston, Henry & Sons  
 Dumore Co., Inc.  
 Grammes, I. F. & Sons, Inc.  
 Jessop Steel Co.  
 Kelleit Autogiro Corp.  
 Kopp Glass, Inc.  
 Leeds & Northrup Company  
 Lord Manufacturing Co.  
 Linear Packing & Rubber Co.  
 Mine Safety Appliance Co.  
 McCroskey Tool Corp.  
 National Tube Co.  
 Pennsylvania Railroad  
 Phosphor Bronze Smelting  
 Co., The  
 Pittsburgh, The Stamp Co.  
 Rohm & Haas Co., Inc.

Safetee Glass Company  
 Synthane Corporation  
 Shaleros Mfg. Co.  
 Summerill Tubing Company  
 Superior Steel Corporation  
 Universal-Cyclops  
 Steel Corp.  
 Westinghouse Electric &  
 Manufacturing Co.  
 Wiedmann Machine Works  
 Inc.

## TEXAS

Ahlfinger, Max Company  
 Briggs-Weaver  
 Machinery Co.  
 Bradley, Allen Company  
 Baldwin-Duckworth  
 Division  
 Becket Electric Co., Inc.  
 Continental Screw Company  
 Cannon Electric  
 Development Co.  
 Dixie Disinfecting Company  
 Dorsey Co., The  
 Engineering Sales Company  
 Earle Lock Company  
 Eggelhof Engineers  
 Gulf Oil Company  
 Gisholt Machine Company  
 Hirsig, A. H.  
 Huey Electric Co., J. M.  
 Hunter-Hayes Co.  
 Harter, C. J., Machinery Co.  
 Hamilton-Huster  
 Machinery Company  
 Harvey Hubbel Company  
 Kearney & Trecker Corp.  
 Layne Texas Company  
 London Machinery Corp.  
 Lunkenheimer Co.  
 Lamson & Sessions Co.  
 McArdle Equipment Co.  
 McDonald, H. F. Co.  
 Magnolia Brush Mfg. Co.  
 Magnolia Airco Gas Products  
 Company  
 Motor Parts Depot  
 Miller & Miller Motor  
 Freight Lines  
 Nelson Electric Supply Co.  
 Ohmite Mfg. Company  
 Parker Griffith  
 Penny, Sam H.  
 Preston Machine Tools  
 Sales, Inc.  
 Product Sales Corporation  
 Pittsburgh Plate Glass Co.  
 Rogers Printing Co.  
 Southwest Automotive Co.  
 Smith, J. Earl  
 Texas-Pacific Railroad  
 Van Horn, Oliver H. Co., Inc.  
 Weiner Lumber Company  
 Wessendorf, Ne'lms & Co.  
 Wyatt Metal & Boiler Works  
 Well Machinery & Supply  
 Co., Inc.

## RHODE ISLAND

American Screw Company  
 Ariska Webbing Company  
 Hope Webbing Company  
 Patton-Macvay Company  
 Stacklin Corporation

## TENNESSEE

Aluminum Co. of America  
 American Lava Corporation  
 Fisher Body Works  
 Fulton Sylvania Company

## WASHINGTON

Boeing Aircraft Company  
 Pioneer Lumber Company

## WISCONSIN

Algoma Plywood &  
 Veneer Co.  
 Allis Chalmers Mfg. Co.  
 Briggs & Stratton Company  
 Cutler-Hammer, Inc.  
 Dumore Co., Inc.  
 Durant Mfg. Company  
 Fulton Co., The  
 Griffith Hope Co.  
 Interstate Forge Company  
 Ladish Drop Forge Company  
 MacWhete Company  
 Motor Meter Gauge &  
 Equipment Div.  
 Oilgear, The Company  
 Shaleros Controls, Inc.  
 Young Radiator Company

## VERMONT

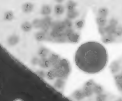
Jones and Lamson  
 Machine Co.

AMERICAN WAY ★





**AMERICA GEARS FOR WAR** A nation of free men, dedicated to peaceful progress, now creates the Arsenal for Democracy and builds in abundance the weapons for its own defense. Everywhere the key to this great effort in factories, forges and shops throughout the nation have been geared to the mass production of parts, materials and sub-assemblies for North American military airplanes, turned out in ever-greater volume at Inglewood, Calif., Dallas and soon at Kansas City.



KANSAS CITY

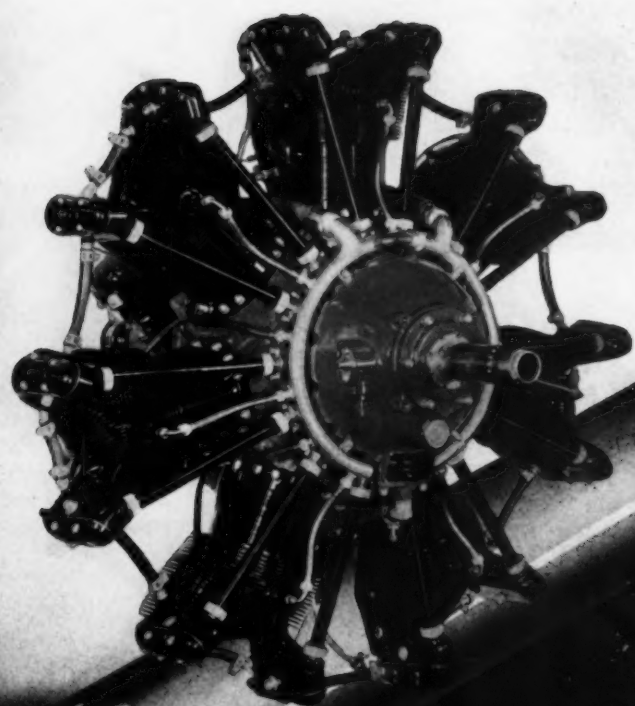


DALLAS

WHO BUILD WITH TEAMWORK IS

*the North American Way*





# JACOBS *Engines*

JACOBS AIRCRAFT ENGINE CO.

POTTSTOWN • PENNSYLVANIA • U. S. A.

CABLES: JAECO



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## 1941 Aircraft Production 'Industrial Miracle' - - Jouett

COL. JOHN H. JOUETT, president of the Aeronautical Chamber of Commerce, told members at their annual meeting in New York City this month that U. S. aircraft manufacturers have already performed "an industrial miracle," adding that they will be called upon to produce nearly 100,000 warplanes during the next two years. He said these American aircraft "will prove to be, beyond any question, the deciding factor in this war."

High points of Jouett's speech are as follows:

(1) Production of nearly 20,000 military planes will be achieved this year, "several thousand more than the most optimistic of government officials dared hope for 12 months ago. This figure is more than eight times the production in 1939."

(2) Annual production rate of 50,000 planes, called for by the President in May, 1940, will be achieved some time next year;

(3) Dollar volume production of planes, engines and propellers in 1941 will exceed \$1,500,000,000, triple the total of last year;

(4) U. S. engine plants have now reached a monthly production rate of nearly 6,000,000 hp., 12 times the rate at the outbreak of war, with peak output of 15,000,000 hp. monthly to be reached in 1943;

(5) Present propeller production is at a rate of over 50,000 units annually.

(6) Aircraft plant space has been increased from 25,000,000 sq. ft. to nearly 46,000,000 sq. ft. during the past year (not counting present construction) and employs from 193,000 to 390,000;

(7) U. S. manufacturers now have either in the design stage or are actually experimenting with 40 new models of military aircraft;

(8) More than 30 different types of American combat craft are now going to the U. S. and British air forces.

"If the production rate is not developed as stated here, or new models not produced to maintain our superiority in the air, it will not be the fault of the aircraft industry; it will be due to other circumstances beyond our control," Jouett added.

### Propeller Bottleneck Seen Almost Broken

GUY W. VAUGHAN, president of Curtiss-Wright Corp., this month expressed a belief that in another two months there will be no propeller shortage.

He told reporters at the dedication of Curtiss-Wright's new Columbus, O., plant that while a few months ago propellers were the principal bottleneck in airplane production this problem is rapidly being solved. Vaughan added that he believed no airplane company is now seriously handicapped by the propeller situation.

Meanwhile, Col. John H. Jouett, president of the Aeronautical Chamber of Commerce, this month estimated U. S. propeller production at over 50,000 annually.

### Canada Prepares To Manufacture 4-Engine Bomber

CANADA has revealed that two Dominion firms, Canadian Car & Foundry Co. Ltd. and National Steel Car Corp. Ltd., will share in the \$75,000,000 order for construction of 30-ton, four-engine British Lancaster bombers. It is also understood that the Canadian Associated Aircraft hangar at Malton, Ont., will be taken over by the government for assembly of the craft.

The latter facilities are now being used by Canadian Associated Aircraft for assembly of Hampden bombers; however, it is believed that by the time parts for the Lancasters are ready for assembly the Hampden contract will have been completed.

#### B-26 Project Abandoned

Canadian Car & Foundry's share of the Lancaster project will probably be filled at its Ft. William, Ont., plant, where Hurricane fighters are being built for the RAF. National Steel Car will manufacture its section of the Lancaster at its new Malton, Ont., plant, near the assembly hangar. Work has already started to transform tools and jigs intended for use in construction of the Martin B-26B to make way for the Lancasters.

A \$27,500,000 contract for construction of 200 B-26Bs at the Malton plant is said to have been canceled.

The Lancaster will be the biggest craft of its kind ever built in the Dominion. Its reported range is 7,000 miles. Critical press comment in Canada followed announcement of the Lancaster project, with one paper pointing out that many months would be lost through abandoning the B-26 after tooling was well along. It is not expected that a Canadian-built Lancaster will be flown in 1942.

#### Seven Types in Program

Meanwhile, C. D. Howe, minister of Munitions and Supply, announced that seven aircraft types comprise the Dominion's production program: Fairchild M-62 elementary trainer; North American Harvard single-engine advanced trainer; Canadian Anson twin-engine advanced trainer; Bristol Bolingbroke twin-engine reconnaissance bomber and trainer; PBV5 Catalina coastal reconnaissance amphibian; a twin-engine fighter and the Lancaster four-engine bomber.

## Parts Plant Nears Completion



GOODYEAR Aircraft Corp., Akron, O., last month announced that its three-unit manufacturing plant at the municipal airport is rapidly approaching completion and that a total of 10,000 workers will be employed within a few months.

Exteriors of both the 400x1,000-ft. Defense Plant Corp. building (foreground) for the manufacture of aircraft subassemblies and the smaller airplane parts building (upper right) are virtually completed, and

tools and machinery are being installed.

The airship dock (background), world's largest building without interior supports, already has its entire floor space and a considerable mezzanine area devoted to aircraft manufacturing.

Goodyear is now producing, or will soon be making, parts and subassemblies for Glenn L. Martin, Consolidated, Grumman and Curtiss-Wright.

## Aircraft Labor Market to Narrow As Armed Forces Take More Men

THE AIRCRAFT industry soon may no longer have the pick of young men for employment in its rapidly expanding plants.

This was indicated several days before the outbreak of hostilities by Lt. Col. Joseph H. Battley, chief of the Labor Division in the Under-Secretary of War's office, who declared that active competition between the armed forces and industry for "the young and physically superior men must cease."

"There just are not enough to go around, and the training programs for defense workers now in operation must be supervised with a view to training for defense employment men who are not eligible for military service."

#### Re-Examination Proposed

He indicated that re-examination of Selective Service registrants in Classes 2-A and 2-B is contemplated by the Army in readiness for any occasion "when our military manpower needs multiply vastly." The time to which Lt. Col. Battley referred came three days later when this country declared war on Japan.

For many months the aircraft labor market has had a negligible number of skilled machinists, tool and die makers, jig and fixture builders, machine tool operators, engineers, inspectors, final assemblers, electricians, riveters, sheet metal workers, woodworkers, etc. But there has almost always been a plentiful supply of A-1 male train-

ees. This may soon be changed, and training courses are likely to find themselves with increasingly large numbers of women and men above draft age or slightly under par physically.

Pre-war estimates placed the aircraft industry's need for new employees at over 300,000 between now and next August. A speeded-up production program and reclassification of men now deferred may boost that total further.

#### Hiring Rate to Rise

It is significant that over two-thirds or about 276,000, of the 397,000 new workers needed in the aircraft industry during the 12 months between Aug. 1941, and Aug. 1942, will be hired during the second six-month period when the demand for men for the armed forces will rise swiftly.

### Kellett Autogiro Leases Additional Factory Area

Kellett Autogiro Corp. this month announced leasing a plant owned by Gulf Oil Corp. at Upper Darby, Pa., with option to buy. The unit will give Kellett 26,000 sq. ft. additional manufacturing space and will supplement present facilities.

The newly-acquired plant is expected to be in limited production shortly after Jan. 1. When in full production it will employ a maximum of 500 workers.

# Airlines to Show Record Profits for Year

## Air Transport Industry Reports \$3,500,000 Earnings in 9 Months

WHEN THE airline ledgers are closed for 1941, it is expected that the industry will report the largest aggregate net profit in airline history; this despite rising costs that in the first half of the year threatened to nullify much of the revenue gains derived from record traffic in every department.

For the first nine months of this year, the domestic air transport industry recorded a net profit of approximately \$3,500,000, after all taxes, according to a compilation by AMERICAN AVIATION of the monthly reports filed by the carriers with the Civil Aeronautics Board.

### Strong Finish Expected

While this represents a decrease of about 18% from comparable earnings in the corresponding period a year ago, heavy fourth quarter traffic is expected to lift the 1941 profit figure well above the \$4,250,000 netted in calendar 1940.

The extent to which expenses this year have mounted at a faster rate than revenues is shown in the airline reports to the CAB. While the defense traffic boom lifted aggregate operating revenues to \$71,391,000 in the first nine months of this year, approximately 26% above the figure for similar period of last year, total operating expenses climbed to \$65,694,000, some 30% higher than a year ago.

Thus, whereas in the first nine months of last year 7.5% of the aggregate revenue was converted into net profit after taxes, in this year's comparable period less than 5% of total revenues was transferred to surplus as net earnings.

### Traffic Peaks Reached

Illustrating the traffic peaks reached by the airlines this year: in the first three quarters of 1941, the domestic air transport industry served 2,852,201 revenue passengers, some 50,000 more than in all of 1940; revenue passenger miles flown were up 31% over the total for the first nine months a year ago, with express pound-miles up 49% over the corresponding 1940 period.

Judging from current traffic trends, the revenue passenger total for entire 1941 should reach at least 3,850,000, the revenue passenger mile figure 1,348,600,000.

## SUMMARY OF U. S. AIRLINE OPERATIONS, JAN.-SEPT., 1941

(Compiled by AMERICAN AVIATION from Monthly Reports to CAB<sup>a</sup>)

	Rev. Pass.	Rev. Pass. Miles	Avail. Seat Miles	Pass. Load Factor	Operating Revenue	Operating Expense	Net Income Before Inc. Taxes	Net Income Transferred to Surplus
	00	00	00	00	\$	\$	\$	\$
All American	884,917	302,145,244	433,487,104	60.7%	19,421,627	16,275,390	3,146,237	2,209,283
American	110,913	33,435,496	71,158,454	46.9%	2,452,139	2,521,950	93,222 (red)	97,861 (red)
Braniff	26,425	7,246,426	12,403,272	58.4%	631,402	641,171	77,333	77,333
Canadian Colonial	27,990	939,700	1,225,500	68.5%	142,271	119,395	27,703	27,703
Catalina	44,234	16,726,826	34,176,788	48.9%	1,104,180	1,229,773	129,538 (red)	129,538 (red)
Chicago & Southern	15,340	4,529,114	13,006,254	34.8%	619,688	651,258	39,448 (red)	37,432 (red)
Continental	84,970	19,003,983	35,632,563	42.1%	1,081,833	1,184,710	123,653 (red)	124,101 (red)
Delta	389,627	186,036,208	388,911,476	84.0%	10,080,989	8,379,046	1,710,611	964,286
Eastern	9,911	2,585,360	9,106,020	28.4%	419,463	431,391	16,898 (red)	10,568 (red)
Inland	34,419	4,720,408	6,777,059	69.6%	502,524	406,458	101,347	101,347
Hawaiian Airlines	27,032	6,952,345	18,443,378	37.7%	908,794	1,014,229	116,448 (red)	116,448 (red)
Mid-Continent	25,953	6,550,144	14,933,166	43.8%	552,829	556,695	1,768 (red)	2,366 (red)
National	31,793	5,047,595	11,910,830	42.3%	603,892	622,929	22,784 (red)	22,784 (red)
Northeast	116,771	46,786,502	93,513,979	50.0%	3,585,244	3,042,966	562,836	413,203
Northwest	252,209	47,905,919	92,254,060	51.9%	3,314,617	3,370,616	106,097 (red)	106,097 (red)
Penn-Central	325,321	151,271,015	256,464,712	58.9%	10,449,318	10,606,180	156,540 (red)	156,540 (red)
TWA	426,437	204,392,168	303,074,349	67.4%	14,004,724	12,920,105	995,425	701,625
United	52,379	17,371,102	35,698,294	48.9%	1,491,008	1,471,961	22,099	21,646
Western Air								
<b>TOTALS</b>	<b>2,852,201</b>	<b>1,029,547,525</b>	<b>1,732,176,781</b>	<b>59.4%</b>	<b>\$71,391,548</b>	<b>\$65,694,773</b>	<b>\$5,611,078</b>	<b>\$3,484,886</b>

<sup>a</sup> All monthly reports to CAB are subject to revision and year-end adjustment.

<sup>b</sup> Includes mail revenue only for September, since amount due for Jan.-Aug. service has not yet been reported. Mail rate was established Sept. 15.

<sup>c</sup> Formerly Inter-Island Airways, Ltd.

The 1941 airline profit picture showed considerable improvement in the third quarter, after only four carriers had escaped losses for the first half of the year. (See AMERICAN AVIATION, Sept. 15, 1941, p. 35). At the end of September eight companies were out of the red, with several more likely to enter the black in the last quarter and finish the year with operating profits.

### American Biggest Earner

As in the past, the biggest earner for the nine-month period was American Airlines, returning a net profit of \$2,209,283 after taxes. Eastern Air Lines was next with \$964,298, followed by United Air Lines with \$701,925 and Northwest with \$413,292.

Of the 15 carriers reporting half-year losses, only Chicago & Southern, Continental and Mid-Continent did not decrease their six-month deficits in the third quarter.

Industry revenue passenger load factor in the 1941 nine-month period was practically the same as a year ago, declining only slightly from 59.7% in Jan.-Sept. 1940 to 59.4% this year. Revenue miles flown through September of this year were up 23% over a year ago, with available seat miles operated up 32%.

### Lisbon-England Service Clicks Despite War

War or no war, British Overseas Airways reports that during the past year it has transported 13,500,000 air mail letters and 4,000 passengers between England and Lisbon without loss. Neither war nor weather has caused the service to change its timetable since it opened in 1939, company claims.

## Existing Airlines Will Fight For Place in Feeder Route Picture

DEVELOPMENTS in early December gave definite indication that the existing domestic airlines fully intend to fight for a place in the feeder route picture.

Almost all of the applications for about 42,000 miles of feeder service (mostly air mail pick-up, but with some lines proposing passenger service) have been filed by companies not now in business (AMERICAN AVIATION, Dec. 1). Only existing airline to file has been Mid-Continent.

However, on Dec. 1, CAB learned that other airlines have plans. CAB Examiner J. Francis Reilly called a pre-hearing conference on the applications of Southwest Feeder Airlines. The conference, on those SWF applications proposing passenger service, was to decide preliminary matters leading to the setting of a hearing date.

At the conference were representatives of Braniff, Chicago & Southern, American, TWA, Mid-Continent and Mercury Development Corp. (the latter is not now operating, proposes an extensive system of pick-up routes).

Both Braniff and Chicago & Southern reveals plans to file applications for feeder routes covering some of SWF's territory, and Braniff requested Examiner Reilly to ask CAB for indefinite postponement of SWF's hearing. Braniff explained that it has been studying the feeder route question for some time, but had not filed application because of lack of equipment.

If postponement, opposed by SWF, is denied, Braniff will file within

two weeks after denial, following which another pre-hearing conference will be held. Chicago & Southern will file in any event, it is understood.

As this issue went to press, CAB had not taken action on the request for postponement.

On Dec. 1 also came indication that Northwest Airlines is considering establishment of feeder service to 34 small and medium-sized cities within a 300-mile radius of the Twin Cities.

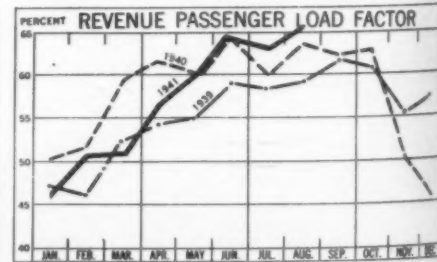
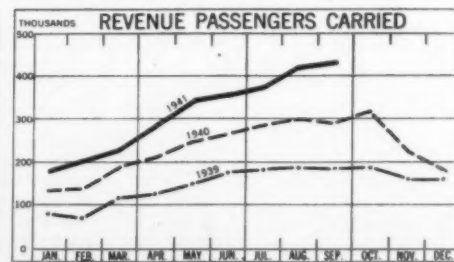
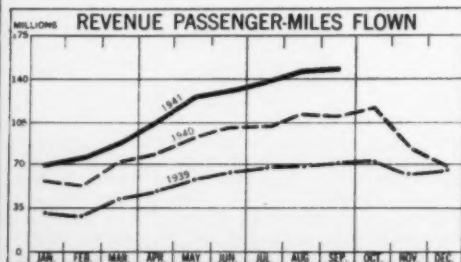
## 'System' Mail Rate Requested by WAL

WESTERN Air Lines has petitioned CAB for a system air mail rate of 35c per mile, claiming that compensation now paid the company is "barely adequate to pay . . . operating expense . . ."

Western's present rates are 40c per mile on AM13, San Diego-Salt Lake City, and 40c on AM19, Salt Lake-Great Falls. No rate has been set for AM52, Great Falls-Lethbridge.

The system rate, WAL said, should apply to the following mail trips: four daily Los Angeles-San Diego, five Los Angeles-Salt Lake, two Salt Lake-Great Falls, two Great Falls-Lethbridge and one Salt Lake-West Yellowstone (from June 15 to Sept. 15).

Until such time as this number of trips is designated, WAL asks payment of "not less than 50c" on all existing mail schedules.



# CAB Blocks Sale of TACA to American Export Airlines

THE Civil Aeronautics Board on Dec. 4 denied the application of American Export Airlines for approval to purchase TACA, Latin American airline, and thus paved the way for wild rumors in the industry as to the future of the prosperous air network operated by Lowell Yerex.

Approval under Export's present set-up is impossible under the terms of the Civil Aeronautics Act, according to the decision. Under Sec. 408(b) of the Act, it would be necessary for the Board, in order to approve the application, to find that TACA's aircraft would be useful in the operations of Export's parent company, American Export Lines Inc., the steamship line.

"The record is devoid of any evidence tending to show that the steamship company proposes to, or can, make any use of TACA's aircraft in its steamship operations," the Board said. "TACA's operations are confined to Central America. The steamship company operates between New York and Lisbon, and between New York and India and Burma, via the Cape of Good Hope. It does not now, nor does it intend

in the foreseeable future, to operate to any port in Central America.

"The record will not support a finding that the steamship company will use TACA's aircraft in any way in its operations."

CAB pointed out, however, that it now has before it the application of the airline for approval of acquisition of control of that company by the steamship line. If the Board ruled that the steamship company must divest itself of its interest in the airline, Sec. 408(b) of the Act would no longer apply and the TACA deal could be reconsidered, the Board explained.

The decision emphasized that denial of the present application "is not to be construed as a disapproval of acquisitions by qualified American air carriers of companies of the type involved in the present case where the applicable provisions of the Act have been fully satisfied."

Meanwhile, in Washington industry circles it was freely predicted by the grape vine that TACA would be purchased within a few months, the prospective purchasers ranging from the U. S. Government to any domestic airline. Authentic reports were lacking however.

## Public Counsel Advises Against TWA and UAL; TWANE Files

UNITED Air Lines' application for a Cleveland-Boston route and TWA's petition for Pittsburgh-Boston service should be denied, according to a brief filed with CAB Examiner F. A. Law Jr., by public counsel.

Public counsel are attorneys on the payroll of CAB who are assigned to represent the public at new route and rate hearings. Their briefs are not supposed to carry any more weight than those filed by the parties.

### TWANE Files

With its eye on this Boston-New York business, TWA and the New York, New Haven & Hartford Railroad on Dec. 1 filed application, under the name of TWA-New England Inc., for the following routes:

(1) Newark-New York to Boston via Bridgeport, New Haven, New London, Providence and Attleboro-Brockton-Taunton (and also between New London and Attleboro-Brockton-Taunton via Newport and Fall River-New Bedford); (2) Newark-New York to Boston via Bristol-New Britain - Meriden-Waterbury, Hartford and Worcester (and also between Newark-New York and Worcester via New Haven, Hartford and Springfield) and (3) Newark-New York to Springfield via Danbury and Pittsfield.

TWANE seeks specific authority to operate non-stop service between Newark-New York and Boston, Worcester, Springfield, Providence and Hartford.

The stock of TWANE is 55% owned by TWA and 45% by the trustees of the railroad. "Applicant

has cash on hand or shortly to be received totaling \$100,000, and has no obligations," application said. If the routes are granted, an estimated \$1,400,000 will be needed and this will be secured by private sale of stock to TWA and the railroad trustees.

In addition to using TWA's Boeing and Douglas equipment, TWANE intends to acquire DC-3's, engines and spare parts of its own.

A total of 21 round trips daily would be operated between New York and Boston and intermediate points.

All officers of TWANE, except one, hold similar positions with TWA. They are T. B. Wilson, chairman of the board; Jack Frye, president; Paul E. Richter, executive vice-president; L. G. Fritz, vice president-operations and E. Lee Talman, vice president-treasurer. Goodrich K. Murphy, assistant to the general manager of the railroad, is a vice president of TWANE.

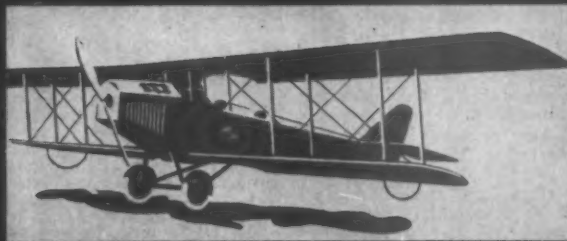
### Seaboard, NEA Seek Routes

Also filing new applications in the New England territory last week were Seaboard Airways and Northeast Airlines. Seaboard asked for a route from Newark-New York to Boston via such intermediate points as the Board may find in the public interest. The company has also filed for New-York-Miami and New York-New Orleans, and intends to furnish through service from Boston to these southern points.

Northeast seeks to have Boston named as an intermediate point on AM27 (Boston-Montreal and Boston-Moncton) and to have the route extended to New York via New Bedford, Worcester and Hartford.

## PLANE TALK

from '17



to '42



Back in 1917, a radio conversation took place between plane and ground. The pioneer equipment used in this demonstration was designed by Bell Telephone Laboratories in cooperation with the U. S. Army Signal Corps—and was made by Western Electric.

Then came years of developing and producing finer, more powerful equipment. As commercial aviation came into being, it adopted Western Electric equipment as its standard of quality. Millions of hours in the air on all the nation's major airlines speak this industry's appreciation of Western Electric's dependable communication equipment.

Now Western Electric is supplying the air forces with many types of aviation radio.

We are proud that for 25 years we have helped to "Keep 'em Flying!"

# Western Electric

## Six British Airlines Continue to Operate Regular Inland Services Despite War

NINE British air transport companies are still in existence and at least six now operate regular internal services in spite of wartime difficulties, according to the British aviation journal *The Aeroplane*.

The magazine, for the first time since the war began, clarifies an issue on which reports have been in conflict.

"Government officials and passengers have priority on all services," the magazine explains, "and, as in the case of British Overseas Airways, there is, we understand, always a long waiting list of ordinary passengers."

Planes used regularly by the British airlines are predominantly de Havilland 89 Rapides, *The Aeroplane* reports, with Scottish Airways operating the largest fleet of any single line—eight Rapides and one de Havilland 84 Dragon.

(The Rapide, according to *Aerosphere* (1939), is a 7 to 9 place twin-engine plane of "box wood structure, spruce longerons, struts inside plywood covering, excepting the floor which has no projection." Maximum speed is listed as 157 mph, cruising speed at 65% power 132 mph, with service ceiling of 16,700 feet. Wing span is 48 feet, gross weight 5,550 pounds. The plane is



De Havilland 89—Britain's Standard Airliner

listed with two de Havilland "Gipsy Six" Series One engines of 200 hp. each. *Aerosphere* does not list the de Havilland 84—Ed.)

The *Aeroplane* reports:

"When in March, 1940, the Air Ministry disbanded all those transport companies which had been operating internal air services, except those which in the opinion of the government were operating routes of national importance, only nine out of the former total of 19 companies were left. Because eight were companies in which the railways had interests, they became known as the Railway Group.

"The nine companies which were left and which are still in existence are: Allied Airways (Gandar Dower) Ltd., Air Commerce Ltd., Jersey Airways Ltd., Great Western and Southern Air Lines Ltd., Olley Air Service Ltd., Railway Air Services, Isle of Man Air Services Ltd., Scottish Airways Ltd., and West Coast Air Services Ltd.

"Of these Allied Airways is the only company not in the Railway Group, and of the Group three companies are not running air services. These three are Air Commerce Ltd., which is in charge of the maintenance of the aeroplanes operated by the whole of the Railway Group; Jersey Airways, which discontinued operations after the evacuation of the Channel Islands; and Olley Air Service, which has an interest in the Group operations through its subsidiary companies, Air Commerce, Isle of Man Air Services and West Coast Air Services. (Not explained is whether Allied Airways continues to operate regular service—Ed.)

"The Railway Group, with the exception of Scottish Airways, has its headquarters at Speke, Liverpool, and has formed a special committee to deal with all the problems and arrangements connected with its various routes. This committee is known as the Associated Airways Joint Committee. . . ."

To show "how fully occupied the home lines are," *The Aeroplane* reports: Scottish Airways, from the beginning of the war to Aug. 31, 1941, on its regular services only flew 1,012,250 miles, carried 34,191 passengers and 1,380,600 pounds of mail and freight.

### 15% Off?

Into United Air Lines' Washington office last week walked a man with an air travel card, complete but for his signature. "These instructions say that this card isn't good unless signed by me in the proper place," he explained. "I thought that if I came to your office I would surely be in the proper place."

Astonished countermen agreed, solemnly watched while their client affixed his signature—in the proper place.

## Route To Britain Sought By Export

ESTABLISHMENT of a permanent mail-passenger-property route between New York and Southampton, England via Foynes, Irish Free State, was asked by American Export Airlines on Nov. 27.

Five days later the company filed application for permission to operate a temporary New York-Foynes service for five years, or until six months after the Secretary of War notifies CAB that the route is no longer required by the national defense.

### Alternate Routes

On Dec. 6, Pan American Airways asked CAB for a temporary amendment to its trans-Atlantic certificate so as to permit it, during the existing emergency and when service to Foynes is not being provided by PAA over the northern route, to conduct service to Foynes by one or more of the following routes:

(1) as an extension of its present service to Lisbon on certain flights; (2) non-stop, or (3) via one or both of the following points: Bermuda and Horta (subject to necessary permission of the Portuguese government to utilize Horta as a landing point when not proceeding to Lisbon).

These applications for temporary service were heard by CAB on Dec. 8 in executive session.

In its petition for a permanent route to England, prompted by repeal of the Neutrality Act, Export also asked that its certificate for New York-Lisbon be made permanent.

(The original order of the CAB approved by the President on July 15, 1940, awarded Export a New York-Lisbon certificate, effective until 60 days after repeal of the Neutrality Act prohibiting service to England and Ireland, unless further application was made by Export. At the time it issued the certificate for Lisbon service, the CAB made no final decision on Export's proposed operation to England and Ireland.—Ed. note.)

The new application gave no details concerning the projected route to England, but stated that Export plans to operate the New York-Lisbon route with one of its three Vought-Sikorsky model S-44 four-engine flying boats, which are now on order at an estimated unit cost of \$730,000 fully equipped.

### \$400,000 Needed

If the New York-Lisbon route is granted, additional capital of \$400,000 will be needed to complete purchase of equipment, inventories and ground facilities, and for additional working capital, the application said.

Estimates of revenues and expenses for New York-Lisbon during first year, with one round trip weekly, are: total revenue (excluding U. S. mail pay) \$800,000; total expenses, \$1,225,000; net operating loss before U. S. mail revenue, income taxes and interest, \$425,000.

On its temporary route to Foynes, Export estimates loss in first year of \$250,000, before mail pay, income taxes and interest.

## New St. Louis-Washington Route Not Needed, CAB Examiner Claims

A DIRECT route between St. Louis and Washington, as proposed by TWA and Eastern Air Lines, is not required by the public interest, according to findings made by CAB Examiner J. Francis Reilly in an advisory report issued Dec. 5.

Examiner Reilly also stated that there was a "paucity of evidence" in the record with respect to TWA's proposed St. Louis-Dayton route "and the record will not permit a finding that presently authorized facilities cannot adequately meet the needs for such service."

Discussing St. Louis-Washington, and the intermediate points, he said "it is apparent that the potential air traffic is relatively small between the points between which the proposed routes would afford substantial savings in mileage."

Although the proposed route might eliminate changes of planes and carriers, the existing carriers could, through more advantageous connections, effect the same savings in time as this route, Reilly pointed out.

In previous decisions, he said, CAB has asserted that it has the power to compel establishment of adequate connections "and has heretofore stated that it would be unsound to grant authority to an applicant to engage in air transportation over a proposed route designed to supply through service as against service rendered by two or more

connecting carriers until it has been shown that the connections provided in good faith have over a reasonable period of time proved inadequate, or unless . . . there is other public need for additional service."

Reilly also said that existing inconveniences might at any time be obviated "at no expense to the taxpayers" by interchange of equipment between carriers.

"The authorization of the route proposed by Eastern would result in establishment of a fourth east-west carrier operating from the northeastern seaboard area which could compete for transcontinental business and would moreover duplicate American's route between Charleston and Washington and, for practical purposes, American's Washington-Louisville service," he stated.

"Furthermore, the inconvenience of change of planes and carriers would still be faced by all traffic west of St. Louis which passed over that point on the proposed route.

"TWA's proposal would similarly duplicate American's Washington-Louisville service and also Eastern's present route between St. Louis, Louisville and Evansville. The fact that such duplications are involved is not a bar to authorization of an additional route, but their effect must be considered."

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## Promotion of U.S.-Latin American Air Service Urged by House Group

THE U. S. government and the aircraft manufacturers should cooperate in a broad-gauge and comprehensive program which has for its objective the promotion of international airline service between the U. S. and Latin America.

This conclusion was reached by Congressman Jack Nichols' Select House Committee to Investigate Air Safety, following its recent inspection tour of inter-American airlines. Beside Nichols, Congressmen Kleberg (D., Tex.), Dirksen (R., Ill.), and Hinshaw (R., Cal.) made the trip.

"A safe airline operation . . . requires planes that are of sufficient capacity and of sufficient motor power to provide convenience, speed and the ultimate in safety over rugged and sparsely settled terrain," the committee said.

"It is suggested . . . that a program be initiated forthwith which is designed to bring ambitious young men from Latin American republics to the U. S. for complete and thorough flight training, so that they may become not only competent pilots but wed to the traditions of this hemisphere . . ."

"The matter of providing international air operations with adequate weather service should receive . . . attention."

### Adequate Airports Asked

"Airports (should be) adequate in size for the larger planes. Such airports must be equipped with every modern facility which is conducive to safety . . . It is entirely possible that, through instrumentality and technical assistance a mutual program can be worked out for the development of airports which will have due regard for the sovereignty of Latin American countries and for the need of the developing of such airports under the supervision and control of those countries."

The committee pointed out that inauguration of night flying in Latin America, with the U. S. government rendering technical and financial assistance to install lighted airways, would materially speed service.

### Manufacturers Anxious

U. S. manufacturers are "genuinely anxious" to continue building commercial transports at the present time, and insist they can do so without interfering with military production, the group said. It added that after the war the U. S. will probably be on a basis of 50,000 planes per year.

"It is obvious, when one contemplates the conditions and the distances which prevail in the sister continent to the south, that South America will be one of the first areas in which the various nations will undertake to develop air travel more fully . . ."

The committee expressed the opinion that manufacturers should be authorized "to proceed forthwith on construction of . . . larger and more powerful planes, that they may be secured without delay for international airline service . . ."

## Lower CCA Pay Is Recommended

LOWER air mail pay for Canadian Colonial Airways Inc. on its New York-Montreal route was recommended Dec. 1 by CAB Examiner Herbert K. Bryan.

Rates proposed by Bryan were: (1) Jan. 9 to Dec. 31, 1940, 52c per airplane mile; (2) Jan. 1, 1941 until the date when Canadian Colonial Airways Ltd. ceases operation, 48c; (3) from the date Ltd. ceases operation until two additional New York-Montreal round trips are designated by the Post Office, 57c, and (4) after two additional trips are designated, 27c.

### Operations to Stop Soon

CCA Ltd. recently was denied a certificate by CAB and is expected to cease operations in the near future.

CCA Inc. now receives 60c per mile for carrying the mail.

Summarizing Inc.'s "mail compensation requirements," Examiner Bryan found:

1. From Jan. 9 to Dec. 31, 1940, the company flew 428,527 pay mail miles, including the mileage on which only foreign mail was carried. Non-mail revenues amounted to \$355,340 and operating expenses \$543,680, which would require \$188,340 to break even.

2. From Jan. 1, 1941, until Ltd. ceases operations, it is estimated that Inc. will fly an annual average of 417,318 pay mail miles, including the mileage on which only foreign mail is carried. Annual non-mail revenues for the period will be \$371,683 and annual operating expenses \$533,289, requiring \$161,606 per annum mail pay to break even.

3. From the date Ltd. ceases until the P. O. designates additional schedules, it is estimated that Inc. will fly 417,318 air mail and foreign air mail miles annually, resulting in non-mail revenues of \$527,404, operating expenses of \$722,854, and \$195,450 to break even.

4. After designation by P. O. of two additional trips, Inc. will fly 864,088 mail and foreign mail miles annually, will receive \$527,404 in non-mail revenues, against \$722,854 expenses, or \$195,450 to break even.

Bryan noted that Sigmund Janas, CCA Inc. president, receives \$15,000 per year as president of Inc. and \$6,000 per year as special adviser to Ltd.

"The presidents of only six airlines, the larger carriers, receive compensation in excess of \$15,000 per annum," Bryan said. "It is believed that \$15,000 for the services rendered by Mr. Janas would be a very liberal allowance as compensation, and would be considerably more than the salaries of presidents of other airlines of a comparable size."

### \$9,000 Allowance

"After deducting the \$6,000 received from Ltd., the allowance for salary of Inc. would be \$9,000 per annum."

Bryan said the record also showed the Janas was a consultant to TWA at a salary of \$1,400 per month.

## Airline Briefs

According to reports from Chicago, the airlines have entered into an agreement with the city council to pay part of the cost of operating airline buses to and from the Loop. The city will receive 10% of gross revenue, or a minimum of 10c per passenger (300,000 passengers rode the airline buses last year).

Pan American Airways' traffic through Miami will total 90,000 to 100,000 by the end of 1941. Passengers aggregated 81,426 in first 10 months compared with 65,009 in same period of 1940 and 77,248 for all of 1940. Travel during October set a record, with 3,166 passengers departing and 3,235 arriving. This was 44.1% over October last year and 106.8% over 1939.

Chicago & Southern's determination to develop the Detroit territory (company has asked CAB for permission to operate into the city) is seen in the recent opening of an off-line office at Room 629 Book-Cadillac Hotel. William R. Gillen is city sales manager.

Trans-Canada Air Lines carried 135,581 lbs. of air mail in October, setting a new record. The total compared with 94,164 lbs. in the same month of last year. TCA carried 9,383 passengers in October, compared with 9,165 in Oct. 1940.

Nationwide air express established all-time highs in gross revenue, shipments and weight during the first nine months of 1941, with poundage carried exceeding that of the entire year 1940, according to Railway Express Agency.

Shipments for nine months increased 26% from 751,747 in 1940 to 947,760 in 1941; poundage was up 50% from 5,283,580 to 7,927,181, gross revenue jumped 42.7%.

Air Line Mechanics Association has completed amended employe agreements with Northwest and Pennsylvania-Central. NWA contract "provides a substantial boost in wages" retroactive to Nov. 1, plus certain overtime features, while PCA agreement "establishes a new high of compensation for apprentice mechanics in the airline industry," raises other wages, provides for setting up shop committees, overtime, vacations, etc. ALMA also hints that agreements with Braniff and Mid-Continent are near.

Mid-Continent is growing. The company now has 328 employes, with 52 having been added since July 1.

Hawaiian Airlines, which recently took delivery of three Douglas DC-3's, has sold a Sikorsky S-43 and two Pratt & Whitney engines to Royal Dutch Airlines. Sale price of the plane was \$94,750, or a net gain of \$25,418 over book value.

Within the next few months, Pennsylvania-Central will move its general offices and maintenance base from Pittsburgh to Washington National Airport. PCA will thus become the first airline with headquarters in the nation's capital. Approximately 600 employes will be based at Washington National.

## NECESSITY BROUGHT ABOUT BY WORLD WAR NUMBER I FURNISHES PROVING GROUND for NO-OX-ID

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● NO-OX-ID "EEE" (Triple E) is the resulting product of constant research keeping pace with changing developments in engines.

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# Examiner Favors PAA Over Export For New Orleans-Guatemala Link

CAB Examiner Thomas L. Wrenn on Nov. 29 recommended that CAB grant Pan American Airways a route between New Orleans and Guatemala City, and deny applications of American Export Airlines for routes in the same general territory.

In making his recommendation, Examiner Wrenn went contrary to the suggestions contained in the brief of public counsel, which stated that a link between New Orleans and Central America was not required.

Specifically, the advisory report recommended (1) a New Orleans-Guatemala City link for PAA, (2) denial of PAA's application for New Orleans-Havana-Balboa, and (3) denial of Export's applications for New Orleans-Carmen-Guatemala City-San Salvador-San Jose-Balboa and New Orleans-Havana.

"Pan American presently operates between Guatemala City and Balboa as part of its operations in Mexico, Central and South America," Wrenn said. "As its application indicates, it can furnish transportation by the addition of 1,075 miles of new route from New Orleans to Merida, Guatemala City and other Central American cities and to the Canal Zone. The fact that it proposes to operate the schedule originating in

New Orleans through to the Canal Zone does not alter this fact.

"Pan American can either operate the New Orleans schedule non-stop between Guatemala and the Canal Zone as an additional flight or can transfer its passengers from New Orleans at Guatemala to the Brownsville-Canal Zone flight. The question of whether the operation of an extra schedule is efficient management is one for consideration in a mail rate, rather than the instant proceeding."

## Export's Costs Higher

Export's proposed operation to the Canal Zone would involve establishment of 1,950 miles of new route, Wrenn noted, adding that PAA's estimate of capital expenditures was \$177,000 against Export's \$1,200,000, not including the cost of the Consolidated 28 and Sikorsky S-44 aircraft.

"It is inevitable that those expenditures which, to some extent at least, will be reflected in operating expenses through depreciation charges will result in a higher cost for Export's operations," he said.

Export had conceded that an established operator could perform service at less cost in early years, but that this should not be the controlling factor. The company

stated that its proposed route would provide competition and insure an economical and efficient Latin American airline system, but that denial would virtually exclude competition in this area.

"However, if Export is unsuccessful in its proposal to acquire TACA, authorizing it to conduct the proposed operation would result in three carriers operating in competition with each other in Central America, two of which would be U. S. carriers," Wrenn said. "Neither applicant contends that there is any need for that amount of service nor does the evidence show such a need."

"If Export is successful in acquiring TACA, its operations will be confined to a Central American operation, and it is questionable that a competitive operation in Central America would provide much of a standard of comparison, as Pan American's Central American operations are only a small part of its operations in Latin America."

## Fits PAA System

"Authorization of Export's proposed operation might well result in the creation of a yardstick which would cost more than the operation for which it was intended as a measuring unit. Carried to its logical conclusion, Export's argu-

## TACA Permit Urged by Board Examiner

TACA, Latin American airline, should be granted a foreign carrier permit for transportation of persons, property and mail between San Jose, Costa Rica, and Balboa Canal Zone, according to a proposed report issued recently by CAB Examiner Herbert K. Brown. TACA's application, he said, related to the national defense and "national defense considerations alone require the issuance of a permit to the applicant."

ment in this instance would necessitate an extension of Export's services through South America, in order to provide the standard of comparison. . . . Furthermore Pan American operates through South America and the proposed operation would be an alternate avenue to Central and South America, fitting into its existing operations.

"On the other hand, Export would operate only to the Canal Zone and would be forced to engage solely in Central American operations, which would be dependent on connections with other carriers at the Canal Zone."

"As between Export and itself, it is natural to assume that Pan American in its South American operations would favor its own connections at the Canal Zone or even operate through schedules without change of equipment. Under these circumstances, it is difficult to see how Export could compete."

# PRIORITIES Hit Leadership First

THIS is quite natural as leaders generally build more and consume greater quantities of materials. After a time, if raw materials cannot be kept flowing into receiving rooms, there is bound to be a change in production methods and material specifications.

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Engines is being maintained. Some purchasers of planes due to this period of change have made deviations in their orders to take what was available. Insofar as Continental is concerned, we are sorry we were not able to serve any customers that could not get their desired delivery.

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# Board Ups C&S Mail Pay \$240,000

AN INCREASE of \$240,000 a year in air mail pay was granted to Chicago & Southern Air Lines recently when the Civil Aeronautics Board announced new rates for the company.

At the same time, the Board established an important precedent by stating that it would compensate the company, through mail pay, for operation of a route before that route actually carried mail.

Rates set for AM8, Chicago-New Orleans, were: for the period Dec. 1, 1939, to Feb. 28, 1941, 35c per mile; Mar. 1, 1941, to June 11, 1941, 51c; June 12, 1941, to Nov. 30, 1941, 59c; on and after Dec. 1, 1941, 22.5c; in the event the local Chicago-Memphis schedule is discontinued, 26.5c.

For AM53, Houston-Memphis, from June 12, 1941, until a second round trip is designated, 46c; after designation of a second trip, 35.5c.

For the year ended Dec. 31, 1940, C&S had received an average of 32.62c per mile on AM8. No rate had been set for AM53.

## Similar Situations Expected

The situation—and similar ones are expected to arise—on which the Board for the first time made its position clear was as follows: On Dec. 6, 1940, C&S received a mail-passenger-express certificate for the Memphis-Houston route. The Civil Aeronautics Act states that a carrier must inaugurate service within 90 days after receiving a certificate. On Mar. 1, 1941, C&S opened the route. The Post Office Dept., however, did not place mail on the route, stating that it had not yet received an appropriation from Congress covering AM53 service.

The appropriation was finally made, and mail service was inaugurated on June 12, 1941.

Questions confronting CAB: what about the period from Mar. 1 to June 12? Mail service was available but the P. O. didn't use it. Should they give C&S something in the AM8 rate for this period to take care of AM53? The P. O. said emphatically no.

## Board Is Divided

The Board split on the answer. Members Oswald Ryan, Grant Mason and George Baker said yes. Member Edward P. Warner said no. Result: AM8's rate for Mar. 1 to June 12 was upped to 51c, to compensate C&S for AM53 during that period.

"Section 406(b) (of the Civil Aeronautics Act) directs this Board to take into account 'the need of each . . . air carrier' after taking into account 'all other revenue' of that carrier," the majority pointed out. "The 'need' is that of the air carrier as a whole and not that of any particular geographical division of its operations. This language precludes the Board from confining its consideration of the carrier's need to that manifested on a segment of its system upon which mail is carried to the exclusion of its need on particular certificated segments of its system serving commerce and national defense alone."

They added: "It seems clear . . . that when the inauguration of . . .

a service is so authorized under the Act by the Board, and when the Board as the agency of the Congress finds that government support of such service is required under the standards set forth in section 406(b) . . . the expenditure of air mail appropriations for that purpose is clearly one 'authorized by law' within the meaning of the so-called Anti-Deficiency Act."

Dissenting, Warner agreed that CAB has the power to consider non-mail routes but is under no direction to do so.

"The course of waiting for assurance that the total amount of

money provided would be so increased as to justify the inauguration of a newly-certificated service, if that course were adopted, might at times cause appreciable delays in the actual starting of the service; and that is regrettable; but the risk is one inherent in the governmental system under which we live," he said.

U. S. airlines were glad to see this situation cleared. They may be faced with similar ones in the future. Delta already has one pending, and disposition of it will be simplified by CAB's declaration in the C&S case.



C. A. B. APPLICATIONS, HEARINGS, DOCKETS

## Applications

Western Air Lines has petitioned CAB for a system mail rate of 35c per mile. Complete story on page 30.

Northeast Airlines has asked to have Boston named as an intermediate point on AM27 (Boston-Montreal, Boston-Moncton), and to have AM27 extended from Boston to Newark-New York via New Bedford, Worcester and Hartford.

TWA-New England Inc. has filed application for service between New York and Boston. Complete story on page 31.

Pan American Airways seeks permission to include Camaguey, Cuba, as an intermediate point between Miami and San Juan and between Miami and the Canal Zone.

American Export Airlines and Pan American have asked permission to start operations to Foynes, Irish Free State. Complete story on page 32.

National Airlines requests CAB to adjust its mail rates so that the company may carry mail on three round trips daily over AM31 and 39 for the same aggregate compensation as presently received for two round trips.

Seaboard Airways has filed formal application for a route between Newark-New York and Boston via such intermediate points as CAB may find in the public interest.

## Examiners Reports

**PAA Favored:** CAB Examiner T. L. Wrenn has recommended establishment of a New Orleans-Guatemala City route with Pan American Airways as the operator. Complete story on page 34.

**CCA Mail Rates:** CAB Examiner Herbert K. Bryan has recommended adjusted mail rates for Canadian Colonial Airways. Complete story on page 33.

**St. Louis-Washington Disfavored:** A new route from St. Louis to Washington, as proposed by TWA and Eastern, is not required by the public interest, according to CAB Examiner J. F. Reilly. Complete story elsewhere.

## CAB Decisions

**Bathurst Okayed:** Pan American Airways may serve Bathurst, Gambia, as an intermediate stop on its Miami-Leopoldville route in place of Monrovia, Liberia, until suitable airport facilities are available at the latter point, CAB has stated.

**Export-TACA Turned Down:** CAB has refused to approve purchase of TACA by American Export Airlines. Complete story on page 31.

**TWA Mail Pay:** CAB has ordered that upon designation by the Postmaster General of a fifth round trip mail schedule between Kansas City and Los Angeles on TWA's AM2, the base rate of 17c per airplane mile for AM2 shall be reduced to 16c. The total amount of mail compensation to be paid TWA "will not be substantially increased or decreased" by this adjustment, the Board said.

**UAL Stop Approved:** United Air Lines has been permitted to inaugurate service at Salem, Ore.

## Hearings and Oral Arguments

**Mexico City Case:** Hearing had opened as this issue went to press on the application of American Airlines to serve Mexico City.

**Foynes Hearing:** A closed hearing was held Dec. 8 on applications of Pan American and American Export to inaugurate service to Foynes, Irish Free State.

## Miscellaneous

**Merckling Directorate:** Pan American Airways is seeking approval of an interlocking directorate involving John O. Merckling as assistant comptroller of Pan American Airways-Africa Ltd. and Pan American Air Ferries Inc. Merckling is now assistant comptroller of PAA Inc., PAA Corp. and PAA Co.

**PAA Asks Intervention:** Pan American Airways has asked permission to intervene in the application of Northeast Airlines for a route serving Army bases in Newfoundland.

**NWA Withdraws Application:** Northwest Airlines has been permitted to withdraw its application for a route between Seattle and Vancouver.

**MCA Directorates:** Mid-Continent has asked approval of Oliver L. Parks as president of Parks Air College and as a director of MCA, and of J. Morrell Foster as president-director of Sioux Skyways and as a MCA director.

**Wolfe Approved:** Interlocking relationship involving Thomas Wolfe as vice president of Western Air Lines and director of Bowlius Sailplanes Inc. has been approved.

# Pan Am Expands Mexican Service

PAN AMERICAN Airways, through Cia Mexicana de Aviacion, its Mexican subsidiary, has instituted daily service between Los Angeles and Mexico City and has extended its Mexico City-Monterrey line northward to Nuevo Laredo, on the Texas border.

Los Angeles-Mexico City service had formerly been three times weekly. CAB had refused to grant Pan Am a certificate for this route, stating that CMA could handle the traffic, increasing schedules if necessary.

Announcement of the increases came as hearing opened on the application of American Airlines for a route from El Paso and Ft. Worth to Mexico City.

There is no U. S. airline connection at Laredo, although a CAB examiner has recommended that Braniff Airways be permitted to operate between San Antonio and Laredo. Final action has not been taken by the Board.

Pan Am now operates two daily services from the Brownsville gateway to Mexico City, with one of the schedules continuing on to Guatemala City. Load factor on this route has been 78% for the last six months, and the company expects the new services to alleviate this condition.

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**CONTINENTAL AIR LINES**

## Bern, Pollet Named AA Vice Presidents

EDWARD G. BERN, national director of publicity for American Airlines, and Max J. Pollet, assistant to Vice President O. M. Mosier, have been elected regional vice presidents of the company, according to C. R. Smith, president.



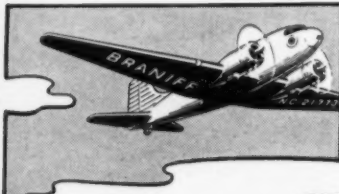
Pollet

Bern

Bern will be located in Chicago, while Pollet will have headquarters in Washington, D. C.

A veteran of 24 years in aviation, Bern has been AA's national director of publicity since 1937. After serving in World War I, he returned to the U. S. and later organized and was the first president of Kansas City-Wichita Airways. Later, he was president of Columbia Airlines.

Pollet entered air transportation in 1929 as city traffic manager of Colonial Western Airways in Cleveland. In 1930, he went to Albany as district sales manager of American. Seven years later he was appointed to a similar position in Buffalo, and in 1940 became assistant to Mosier.



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## Airline Personnel



Gillen

Skinner

Stamps

Shad

### Sales and Traffic

Wilson W. Brown, formerly Mid-Continent's air mail and express manager, has been named head of the new general traffic department, with headquarters in KC.

W. D. King, MCA's auditor of revenue, is now traffic statistician, located in KC. Jerry Meade is TWA's new dtm in SN, transferring from LS.

L. S. Reid has been promoted by NWA from dtm in CG to the newly-created post of assistant general traffic manager.

James J. Fauteux, of NWA's DH staff, is now dtm in CG.

Jack Veasey, William S. Meadows, Jr., James E. McGahee, E. E. Hassler and Leslie Baggott have joined EAL's reservations department in AG. New CG employees are Jean Millar and Jim White.

James H. Baldrige, of the FBI, is PCA's new personnel director.

Raymond Dyer and Daniel C. Meenan, of UAL's general office, and H. H. "Bus" Murphy, formerly assistant manager of the agency department in NY, are working in the company's newly-formed legal division.

John F. Day, formerly assistant personnel director for AA in NY, is in charge of the new personnel office in CG.

Ida Staggers is new system chief hostess of TWA.

Bill Pace, of AA's WA staff, is now dsm in BO.

Henry K. Vieman has been transferred by UAL from CG to SN as station manager.

Joe Shirley has been promoted to EAL's agency desk in NYA.

Violet C. McNeil is chief stewardess for UAL's Salt Lake-Cheyenne-Denver division.

W. A. Looney and W. W. White have been promoted to assistant inside sales managers for UAL in NY.

George Croston is now sales representative for MCA in the MP territory.

Ray E. Stamps, C&S dsm, has been transferred from PS to NO, succeeding Lloyd J. Ziblich. John J. Shad has been transferred from CG to PS to succeed Stamps.

John G. Hughes is now C&S city sales manager at JA.

William R. Gillen has been named csm for C&S in DO, James Skinner fills a similar position at LS and Forest J. Campbell has taken over at HU.

### Operations

Allan Bonnalle assistant to the executive vice president-operations of UAL, has taken a one-year leave of absence to join the Navy's Bureau of Aeronautics. Capt. R. W. "Dick" Pears is now assistant chief pilot for Braniff, succeeding G. S. Cassidy, who has re-joined the CAA.

New EAL captains include G. M. Sheridan and F. J. Black, Jr.

New EAL pilots include O. M. Cokes, Jr., F. R. Hollingsworth, J. L. McClure, Jr., W. J. Hayward, Frank Baque, Jr., E. J. Cowles, P. J. Saltanis and B. D. Scott, all based at NY; J. G. Brannon, P. E. Odell and J. M. Kirkpatrick, based at AG, and Lewis Orton and M. E. Karpowicz at NK.

Five promotions in American's communications department are: Stanley Irwin, supervisor of radio equipment, promoted to supervisor of communications equipment; G. E. Mears, supervisor of telephone and telegraph, to supervisor of communications operations; R. L. Bibb, system chief operator, to regional chief operator; R. E. Blanton, assistant system chief operator, to regional chief operator NY, and G. D. Rayburn, assistant system chief operator, to regional chief operator PV.

L. E. Boisblanc is EAL's new radio chief at CG, replacing R. L. Daniel, who has joined Pan Am at Lima, Peru. Charles O. Hearon, Jr., is EAL's field manager at TJ.

Dr. Howard K. Edwards has been named director of EAL's aero-medical department, succeeding the late Dr. Ralph N. Greene.



Edwards



Reid

Pears

Fauteux

Meade

## Loening Joins AAA; James Ray Resigns

INCREASED activity in air mail pick-up operations was forecast Dec. 3 when All American Aviation pick-up pioneer, announced that Grover Loening, noted aircraft manufacturer, engineer and investor, had become associated with the company as engineering adviser and had been elected a member of the board of directors.

At the same time, the company announced that James G. Ray had resigned as vice president-operations to join Southwest Airways at Ft. Worth, Tex.

As engineering adviser of AAA, Loening's services will be available in connection with the program that has been undertaken by the company to develop further the capacity of the pick-up system to handle heavier and larger loads for both commercial and military purposes, according to Richard C. du Pont, president.

## Panagra Personnel Shifts Announced

DOUGLAS CAMPBELL, vice president of Pan American-Globe Airways, and who has been in charge of the company's business in South America, with headquarters in Lima, Peru, has been transferred to the New York office, according to announcement by the board of directors.

T. J. Kirkland, who has been Panagra's operations manager since 1939 and who was elected vice-president in 1940, has succeeded Campbell at Lima.

J. T. Shannon, the company's maintenance engineer since 1937, has been elected a vice-president and will continue to make his office at Lima.

Capt. C. R. Disher, chief pilot since 1938, has been appointed operations manager with headquarters at Lima.

Capt. F. E. Nelson, assistant chief pilot since 1940, has succeeded Disher as chief pilot, stationed at Lima.

B. H. Young, of the maintenance staff, has been promoted to maintenance engineer at Lima.

The advancements and shifts were made necessary by the tremendous expansion of the company's facilities and services.

### Mid-Continent Elects

#### 4 New Board Members

Mid-Continent Airlines announced recently that four new members were elected to the board of directors and that 10 members were re-elected.

New members are George F. Ryan, of Ryan Nichols & Co., St. Louis; Oliver Parks, president of Parks Air College, East St. Louis; Ryl Miller, of Miller Kidder Chevrolet Co., Sioux City, and Don Murdoch, of Cavanaugh Morgan & Co., Los Angeles.

Re-elected were Thomas F. Ryan III, chairman; J. W. Miller, Vernon A. Dorrell, Gen. W. W. Howes, Milton McGreevy, Theodore N. Low, J. Morrell Foster and H. Montgomery Thrall.

## Chicago Devises Master Airport Plan for Future

Anticipating the need of handling 800,000 scheduled air passengers by 1950, a special committee representing the Chicago Association of Commerce, the Chicago Regional Planning Association and the Chicago Plan Commission has devised a master airport plan to meet future requirements.

This plan recommends three major air terminals within three to 10 miles of the Loop or business district, at least one to be finished by 1945, if the airspace surrounding Chicago Municipal Airport is not to become "intolerably congested." Scheduled air passengers at Chicago in 1940 totaled 625,000.

The master plan ultimately would give Chicago four major inner belt airports 20 to 40 miles from the Loop; five "outer ring" airports 40 to 60 miles from the Loop; and 30 secondary airports in Cook and DuPage counties, in outlying Illinois, in the Wisconsin and Indiana sections. Thirty minor airports would be constructed primarily for pilot training.

## TWA Scoop



FIRST in the industry "on the street" with its new 1942 calendar was TWA. Jumping the gun ahead of other companies, this colorful piece first appeared on Dec. 3 and was immediately hung in many offices because of the Dec. 1941 "lead-off" sheet.

## NWA Plans Washington-Alaska Link

A 3,467-mile route from Washington, D. C., to Fairbanks, Alaska would be established if applications filed with CAB by Northwest Airlines are granted.

Several months ago, the company asked for a route from the Twin Cities to Fairbanks, and on Nov. 12 it filed application for a non-stop Chicago-Washington service.

"If applicant's proposed Alaska service were authorized, the granting of this application would provide direct, through, one-carrier service between the Nation's Capital and the strategic Alaskan defense area, as well as make possible a vital link, over the shortest route, with Siberia and the Orient," the company said.

Three round trips daily are contemplated over the Chicago-Washington route, with either DC-3 or DC-6 equipment. The DC-6, not now available, is described by the company as a 27-passenger plane cruising at 200 mph., costing \$175,000.

Even without mail pay, NWA estimates that it would show a profit on the Chicago-Washington link. With DC-3's, total net profit without mail pay in the first five years would be \$61,375, \$130,227, \$132,412, \$134,815 and \$137,458, respectively, company claims, adding that with DC-6's profit would be \$149,707, \$237,825, \$240,007, \$242,410 and \$245,053.

## Shoes Vs. Wives on the Airlines

COST OF transporting a passenger on the airlines: 41.08c per ton-mile. Cost of transporting air express: 85c per ton-mile.

"In other words, it is costing the public citizen of the United States twice as much per pound to ship a pair of shoes by air as it is to ship his wife," says Grover Loening, air cargo expert.

Another Loening revelation: Airlines in 1940 performed 3,000,000 ton-miles of express service. The railroads equaled this in one day.

## "Teamwork"

NORTH AMERICAN

MID-STATE

MID-STATE

Manufacturing COMPANY  
MILWAUKEE, WISCONSIN



AIRCRAFT  
RIVETS

## CESSNA T-50

Advanced Trainer

for the

Royal Canadian Air Force

Equipped with

**SOLAR**

Exhaust Systems



ESTABLISHED 1927

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SAN DIEGO, CALIFORNIA

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## Aero ITI-Trained Men Are

### Upgraded IN ADVANCE



In pictures phases of instruction not ordinarily found or covered thoroughly, private aircraft school courses these photographs indicate how thorough and extensive is the training given by Aero ITI to supply the industry with better qualified personnel.

Personnel department executives—and all other executives concerned with employee selection—can employ the Aero ITI-trained man assured of his upgrading already being well along. This continues to be demonstrated time and again by the many graduates of this school already securely established in the industry. It is the rule that the Aero ITI-trained man soon demonstrates ability beyond his starting job. Numerous are the cases of early transfer and advancement to junior inspection, power plant installation, instrument installation, experimental work, and even such highly specialized work as time and motion study. Men so trained are being requested at this school in far greater numbers than possible to supply... but Aero ITI looks ahead with the industry to building the nucleus of supervisory personnel needed in the still greater future ahead.

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Five Courses in AIRCRAFT MECHANICS and AERONAUTICAL ENGINEERING—including 12 Month Aircraft Mechanics Course Approved by U. S. Civil Aeronautics Administration

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President Lockheed JOHN K. NORTHROP Vice Pres. Consolidated  
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## CPT Schools Organize For Improved Program

THE NATIONAL Association of Colleges and Universities in the Civilian Pilot Training Program was organized at a meeting in Kansas City, Mo., Dec. 1-2, representing 533 institutions where CAA flight training is in operation. Purpose of the association is to improve the defense training value of CPTP in cooperation with government officials.

Elected as co-chairmen of the group are Dr. Frederic S. Klein of Franklin and Marshall College, Lancaster, Pa., for the eastern section of the country, and Roy W. Elliott of Wichita U., Wichita, Kan., for the western section. Secretary is Capt. K. A. MacKenzie, Wentworth Military Academy, Lexington, Mo.

Directors for each CAA region, with alternates in some regions, are as follows: first region director, Dr. Klein; second region, James F. Whelan, S. J., Loyola U., New Orleans, and alternate, Richard C. Keen, Louisiana State U., Baton Rouge; third region, Adrian Van Wyen, Kent State U., Kent, O.; fourth region, Dr. Howard W. Barlow, Texas A. & M. College, College Station, Tex., and alternate, Dr. C. K. Holsapple, Texas Christian U., Ft. Worth; fifth region, Elliott, and alternate, Capt. MacKenzie; sixth region, Boyd B. Bakestraw, U. of California, Berkeley, and seventh region, A. S. Merrill, Montana State U., Missoula Mont.

## CAA Adds New Courses to Train Pilots for Lend-Lease Ferry Flights

A PLAN to supply the Army Air Corps and Pan American Airways with needed ferry pilots and at the same time increase the defense value of the Civilian Pilot Training Program was disclosed in the past fortnight through announcement by Donald H. Connolly, administrator of Civil Aeronautics, that the CAA will soon be turning out "several hundred" pilots for lend-lease ferrying activities.

Candidates for the ferry training will be high-ranking graduates of the CAA's cross-country course, who have already qualified as commercial pilots and flight instructors. To carry out the program, CAA will contract with commercial aviation schools to give additional instruction in instrument and multi-engine flying, as suggested in AMERICAN AVIATION last Oct. 1, when it was reported that the CAA was seeking Link trainer operators and instructors for a new advanced flight course.

Pan American Airways, which is operating the trans-Atlantic North African service for the government, will take many of the CAA trainees on a salary basis for final schooling in celestial navigation and other intricate points of over-water operation.

The commercial aviation schools

### CAA Payroll Reaches 6,992

Number of personnel on the Civil Aeronautics Authority payroll reached a total of 6,992 during October, an 88% increase over the 3,693 employed in June 1939. Of the October total, 4,000 were employed by the Administration and 331 by the Civil Aeronautics Board.

In the same period from June 1939 to October of this year, the number of civil pilots in the U. S. increased 249% from 26,144 to 91,442 and the number of certificated planes 108% from 11,200 to 23,496.

will be in full swing by March, Gen. Connolly said, turning out some 100 pilots weekly from the instrument and multi-engine flight courses.

While details of the program have not yet been revealed, Gen. Connolly indicated that present plans provide for "a thorough instrument course in the Link trainer and 'under the hood' in four-place single-engine aircraft, followed by extensive flying in two-motor Lockheed transports. The transports will be procured by the CAA and rented to the schools."

## CAA Personnel

Chief counsel and director of compliance for the Civil Aeronautics Administration, Richard E. Elwell, has been appointed by President Roosevelt to serve as a member of



Elwell

the U. S. National Commission of the Permanent American Aeronautical Commission. PAAC is an outgrowth of the Inter-American Technical Aviation Conference held in Lima, Peru, in 1937, being organized to standardize aeronautical practices and simplify laws governing international flying. Elwell has also been named to serve on the executive committee formed to facilitate the work of the National Commission, other members being Thomas Burke of the State Dept. and Samuel E. Gates, representing the CAB.

Orion Edward Patton, author of "Aircraft Instruments—Their Theory Function and Use" and former aircraft instrument technician and instructor for the Army Air Corps at Chanute Field, Ill., is now employed in the instrument unit of the CAA's aircraft engineering division.

Philip D. Lucas, head of the review section of the CPT performance division, has left the CAA on indefinite leave of absence for active military service.

Edwin F. Smellie has been appointed chief of the performance division of CPT to succeed W. G.

Stewart, now assistant director of the program. Harley P. Clapton, formerly in CAA Region 1, is Smellie's assistant.

To assist in recruiting new air traffic controllers needed in the towers which CAA is taking over, Victor F. Kayne, chief of the airport traffic control tower force at Washington, has been assigned to the CAA personnel office. A. V. Carroll, of the communications division, has likewise been assigned to the personnel office to coordinate activities between the main and field offices during the present expansion.

### Exhibit Group Named

The advisory committee for the second Eastern Light Airplane Exhibition, to be held at Grand Central Palace, New York, Feb. 21 to Mar. 1, in connection with the National Sportsmen's Show, is comprised of George Arents, Peter C. Bals, Alfred B. Bennett, George Edwards, Sheldon H. Fairbanks, O. E. Hebert, Spencer G. Leech, T. W. McNary, Paul A. Schweizer and James Welsh. Bennett, Hightstown, N. J., Piper Cub distributor, is serving as chairman.

### Miami Maneuvers Off

Because of the suspension of private pilot certificates, announcement was made on Dec. 8 of the cancellation of the All-American Air Maneuvers, scheduled for Jan. 9-11 at Municipal Airport, Miami, Fla.

## American Aviation Directory

REVISED AND ENLARGED FALL EDITION JUST PUBLISHED

Essential for the offices of every firm . . . for the desk of every executive. The only company-personnel reference book covering every branch of aviation—U. S., Canada and Latin America.

Aircraft  
Engines  
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Schools  
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Names, titles and addresses of officers, administrative and operating personnel. Grouped by firms and organizations under major classifications. Completely cross-indexed.

### AMERICAN AVIATION DIRECTORY

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WASHINGTON, D. C.

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Single Edition \$3  
Two Editions \$5

IN COLUMBUS, OHIO . . .

# Another

## CURTISS MILESTONE

The New Curtiss Columbus Plant  
Adds its Production Might to  
the Nation's Defense Effort



Curtiss U. S. Navy  
SB2C-1  
Dive Bomber

★ The dedication of the new Curtiss Columbus plant on December 4 forges another strong link in the country's Defense Effort.

Already engaged in production of Dive Bombers and Scout Observation Planes for the United States Navy, Columbus, like Buffalo and St. Louis, is geared to produce all of the many types of Curtiss Military Aircraft. Its floor area—1,282,000 square feet—is greater than all of the facilities of the Airplane Division of Curtiss-Wright in 1940.

Curtiss U. S. Navy  
SO3C-1  
Observation



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*Corporation*  
AIRPLANE DIVISION

BUFFALO, N. Y. COLUMBUS, O. ST. LOUIS, MO.

# THEY SEE BETTER WITH RANGER

Today's training tempo . . . busy runways . . . aprons and taxiways crowded . . . novices at the controls . . . makes good taxiing visibility a *prime* necessity. Ranger's six air-cooled, inverted cylinders in line permit ample propeller clearance, yet a cowlings so closely streamlined up to the hub as to provide a clear view forward and downward for the pilot in either cockpit.

Ranger's light weight enables *both* cockpits to be set well forward. Hence a student, even in the rear cockpit as shown in this actual photograph, can see ahead and below, where he needs to see, in incomparably superior fashion.

Through thousands of hours every busy day, hundreds of Fairchild M-62 Ranger-powered Trainers (the Army's PT-19) thus waste less time pussyfooting on the ground, spend more time profitably training in the air.



*With Ranger there can be  
no compromise with quality.*



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# Vultee-Consolidated Merger Moves Ahead With Registration of 240,000 Shares

THE acquisition of control of Consolidated Aircraft Corp. by Vultee Aircraft Inc. (see AMERICAN AVIATION, Dec. 1), moved a step nearer when Vultee filed a registration statement with Securities & Exchange Commission covering securities through which a large portion of the purchase price is to be raised.

Specifically, the statement filed at the San Francisco office of the Commission covered 240,000 shares of \$1.25 cumulative, convertible preferred stock, no par value, and 650,000 shares of \$1-par common reserved for conversion of the preferred. The statement noted that the proceeds of the preferred would be used in "part payment of 440,000 shares of common stock of Consolidated . . ."

## Price Not Given

Although the price at which the shares would be sold was not given, Vultee had said earlier that "it is expected that a portion of the cash funds will be obtained by the public sale of approximately \$6,000,000 . . ." of preferred stock. The total purchase price of the stock, which is owned by Maj. Reuben H. Fleet, president of Consolidated, and others for whom he is agent, was set by Vultee at \$10,945,000, but this amount will be whittled down to \$10,065,000, or \$22.87 per share, by a \$2 dividend on Consolidated stock, payable Dec. 27. The purchase price is payable on or before Dec. 26.

Of the total purchase price, \$9,280,000 is payable in cash and the balance by a 3% note of Vultee in the amount of \$1,665,000, payable either in cash or by 225,000 Vultee common shares. This provision is apparently an alternative method of making payment as Vultee earlier in its statement says that the balance of cash required after the sale of the preferred "will be obtained from the sale of 150,000 shares of Vultee common to the Aviation Corp. at \$10 per share and from additional bank loans and corporate funds." Vultee also says that Aviation Corp. has agreed to buy the common contingent upon the sale of the preferred to underwriters.

## Underwriters Listed

Principal underwriters of the preferred are Blyth & Co. Inc. and Emanuel & Co. The preferred has equal voting rights with the common and is convertible into com-

mon after Jan. 15, 1942, and prior to redemption, which price is set at \$27.50 a share.

The SEC reports Major Fleet's holdings of Consolidated common at the end of October as 348,882 shares, indicating that 91,118 shares of the stock being sold belong to members of his family and other close associates who are disposing of their holdings through him."

## "Army and Navy Aided Us"

Major Fleet, in commenting on the purchase, said that he was not withdrawing from the company and that the job before him now was even bigger than before. He stated that the "charges being made that government dictation has forced me to withdraw . . . are without any basis in fact," but added that:

"The idea of merging Consolidated . . . and Vultee . . . is a natural and the plan has come about in a perfectly normal way. The Army and Navy, with whom both companies do a large percentage of their business, have aided us in our planning."

"One suggestion the government has made is that the president of Consolidated . . . not retire and that there be no drastic changes in management. All through the proceedings there has been a fine spirit of obedience to our common interest in national defense production."

He said that the surface of aviation has not been scratched as yet and that "before we are through, planes like the B-19 and the B-24 will be small fry."

## Maj. Fleet's Status

Major Fleet's future connection with Consolidated is clearly defined. The agreement on the sale of his stock provides that he will resign as an officer and director upon the consummation of the sale, but that he and Consolidated will execute an agreement providing for his employment by Consolidated in an advisory capacity for a period of five years at a salary of \$60,000 a year. The agreement also provides that three-fifths or nine, whichever is larger, of the Consolidated board of directors, shall consist of Vultee nominees.

Vultee in the ten months ended Sept. 30 had a net profit of \$1,790,145, after all charges and provisions for Federal income and excess profits taxes, equal to \$1.70 a share on 1,052,168 common shares outstanding. For the entire fiscal year ended Nov. 30, 1940, net was \$374,457, equal to 36c a share on the

same number of shares. Sales for the ten months were \$21,743,242, compared with \$5,606,410 in the year ended Nov. 30, 1940.

Consolidated reports net profit for nine months ended Sept. 30 of \$5,242,761, after charges and provisions for federal income and excess profits taxes, equal to \$4.08 a share of 1,284,244 common shares outstanding. Net sales for the period totaled \$68,523,856, compared with \$9,349,550 for the full year of 1940.

## Trading Summary

Trading on the New York Stock Exchange moved at a more rapid pace in the period studied, which ended the Saturday before United States' entry into the war, than in the preceding two weeks. Turnover in 25 aviation issues on the Big Board totaled 568,630 shares against 344,070 in the preceding period. Fifteen of the issues showed advances up to 2½ points, eight issues were off and two unchanged. By far the most active issue was Consolidated Aircraft which gained 2½ on a turnover of 106,000 shares following announcement that Vultee would acquire control of that company. Consolidated also announced a \$2 dividend payable late this month.

Lockheed Aircraft was also active 25,200 shares changing hands with a loss of ¼. Stockholders of this company approved a merger with Vega Airplane Co. United Aircraft lost 4½ points on 46,200 shares. This company announced during the period that new financing, to the extent of \$26,000,000, was planned. Aviation Corp. gained ½ on 84,400 shares. North American Aviation gained 1½ on 36,600 shares. Airline stocks advanced almost as a group making gains up to 1 point with only one issue showing a fractional decline.

Trading on the Curb failed to show a definite trend although turnover increased to 118,350 shares from 78,800 in the preceding period. Seven issues showed gains, eight were lower and five were unchanged. Vultee, the other partner in the Consolidated deal, lost ¾ on a turnover of 16,200 shares. The most active issue was Fairchild Engineering & Aircraft which was unchanged on an exchange of 17,800 shares. Cessna Aircraft lost ½ on 13,300 shares.

Although closing prices of today's trading are not available for aviation securities, the market generally suffered losses and the picture presented above will undoubtedly be distorted by this trend of events. While it is too early to evaluate the effect of America's entry into the war on aviation issues, early indications are that these shares may suffer more than the market generally as they were mostly lower than the market average in early dealings. However, whether or not this decline will continue cannot be forecast at this time.

## Lockheed Files New Shares to Effect Vega Merger

Lockheed Aircraft Corp. firm applied to SEC for registration on issuance of 75,960 additional shares of \$1-par capital stock, lifting to 1,075,960 shares the amount authorized, issued and outstanding. Company says articles of incorporation have been amended to raise authorized stock to present figure from 1,000,000.

Company says approximate date of exchange of 75,960 shares of Lockheed for Vega Airplane Co. stock to effect merger of two companies is Jan. 2, 1941.

Formation of a new aircraft company, Vega Aircraft Corp., moved a step nearer late last month when stockholders of Lockheed Aircraft Corp. voted in favor of a merger of that company with Vega Airplane Co. Vega stockholders had previously approved the plan (AMERICAN AVIATION, Dec. 1).

Lockheed stockholders vote was 692,207 in favor of the plan to 5,458 opposed. The Vega vote was 381,074 to 321. The plan has been approved by the California Corporation Commissioner.



## PARKS Training Has Official Recognition

Parks has enjoyed full Federal approval longer than any other aviation school. Parks is accredited in its Aeronautical Engineering School by the Illinois Superintendent of Public Instruction; included in the Accredited Higher Institutions issued by U. S. Office of Education. Parks graduates are qualified educationally for appointment as U. S. Army flying cadets and for flight training in the U. S. Naval Air Reserve.

Recognition of Parks by the entire commercial aviation industry is expressed by consistent demand for graduates. When you need men qualified to win and hold positions of responsibility, write, wire, or 'phone Oliver L. Parks, President.

## PARKS AIR COLLEGE, Inc. East St. Louis, Illinois

ALUMINUM AND  
STAINLESS STEEL  
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AIRCRAFT COMPONENTS, INC.  
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EXCLUSIVELY SUB-CONTRACTORS TO THE AIRCRAFT INDUSTRY

## Aircraft's Biggest Public Financing?

United To Ask Approval  
For \$26,000,000 Issue

UNITED Aircraft Corp., in announcing plans for what it believed to be the largest single piece of financing—\$26,000,000—ever undertaken by an aircraft manufacturer in the public market, reveals that it is laying plans to meet an expected era of rapid development and keen competition in the post-war period. The company also indicates that at that time it may wish to purchase some \$40,000,000 of emergency facilities from the government.

Stockholders of the company will vote on Dec. 30 on a proposal to increase authorized stock from 3,000,000 of \$5-par capital stock to 4,000,000 shares redesignated as \$5-par common and to create 500,000 shares of \$100-par cumulative convertible preferred stock. There are now 2,656,691 shares of common outstanding.

It is planned to offer subscriptions to stockholders at par of 265,669 shares of the new preferred on the basis of one share of preferred for each 10 shares of common held. Proceeds would be around \$26,000,000 and the issue would be underwritten by a group headed by Harriman, Ripley & Co. Inc. The additional common shares would be needed to provide for the ultimate conversion of the preferred.

"What the prospects of post-war aviation may be," the company states in a letter to stockholders, "it is, of course, impossible to foretell, but your management believes that, following the present emergency period, technical and economic developments will give promise of a bright future. Keen competition must be expected, but your management is confident that, with adequate capital at its command, your corporation will be able to maintain its engineering leadership so as to meet successfully any competitive conditions which can now be foreseen."

The company said that the issue and sale of the stock was believed to be desirable for the following reasons:

"(a) While it is expected that, during the present emergency, procurement contracts will continue to be largely self-financing, your management are convinced that, upon return of peacetime conditions, a considerably increased working capital position will be required if the company is to utilize to the fullest profitable extent the expanded plant facilities referred to below.

"(b) As reported in the seventh annual report to stockholders for the year 1940, there have been three major series of expansions in the plant facilities of your corporation since Oct. 1939. The first two expansions, undertaken on account of contracts with the French and British governments, have been completely financed under the respective contracts, and the expanded facilities are now the property of your corporation and may be regarded as forming part of its permanent plant.

"The third series of expansions, involving an expenditure of approximately \$40,000,000, was undertaken to handle the defense requirements of the U. S. Government, and are being financed under Emergency Plant Facilities Contracts, by the terms of which the U. S. government agrees to reimburse the corporation for its expenditures for such facilities over a period ending five years after the completion thereof or upon the expiration of the present emergency, if at an earlier date, whereupon title to the facilities will vest in the government, subject to optional repurchase by the corporation.

"Your management cannot now forecast with any accuracy whether all or any part of those facilities will be required for peace-time operations, but it seems clear that the corporation will not be able to exercise its options to reacquire the same unless provided with substantial cash resources available for that purpose."

The company said that various alternatives for raising additional capital were carefully explored before reaching the decision that creation of a class of preferred stock would be the most satisfactory.

## Latest Earnings Reports

**Beech Aircraft Corp.**—Fiscal year ended Sept. 30, net profit \$471,715, or \$1.17 each on 400,000 \$1-par common shares, compared with a net of only \$68,193, or 17c, in the preceding year. Gross sales were \$8,062,203.

Backlog on Nov. 22, 1941, was \$85,500,000 against \$22,600,000 on Nov. 22, 1940. Personnel on Sept. 30 totaled 5,480 against 1,340 a year ago. Floor area was expanded to 650,000 sq. ft. from 163,500 sq. ft. 12 months earlier.

Balance sheet as of Sept. 30: assets \$13,759,961; current assets \$10,768,582; notes and accounts receivable \$1,831,337; inventories \$6,493,198. Fixed assets \$419,627. Fixed assets—emergency facilities \$2,480,311. Current liabilities \$10,478,245. Long term notes payable \$1,742,806. Common stock outstanding \$400,000. Paid-in surplus \$652,667. Earned surplus \$486,241.

Company states Emergency Plant Facilities costing approximately \$2,480,311 contracted for in the early part of the fiscal period were about 95% complete on Sept. 30, with all major units now in use.

**Pennsylvania-Central Airlines Corp.**—Net income \$165,512, quarter ended Sept. 30, against net loss of \$14,846 in June quarter and loss of \$288,444 in the first quarter. For nine months ended Sept. 30 net loss was \$137,777.

**Airplane Mfg. & Supply Corp.** net profit of \$23,015 for three months to May 31, or 6c each on 373,066 capital shares, against \$42,186, or 11c, for year ended Feb. 28, 1941. Net sales were \$330,497, against \$833,525.

**U. S. Plywood Corp.**—Sales of \$6,608,529 for six months to Oct. 31, against \$4,215,462 for comparable period of last year.

**Aeroquip Corp.**—Net profit \$47,150 for year to Sept. 30. Company states actual production and shipments began in Dec. 1940, and that plant operations have been on a profitable basis since Jan. 1941. Backlog Nov. 17 was "approaching \$500,000" up \$140,000 since Sept. 30.

**Lockheed Aircraft Corp.**—Consolidated and wholly-owned subsidiary, Lockheed Air Terminal Inc., reports net profit after charges of \$5,295,249, or \$5.29 each on 1,000,000 \$1-par common shares, against \$3,165,676, or \$3.17 each, all of 1940. Net sales totaled \$97,500,000 against \$44,936,595 in 1940.

Balance sheet as of Aug. 31: assets \$109,355,396; current assets \$91,000,000 including cash \$6,512,347; inventories \$49,272,082. Current liabilities \$70,000,239. Long term obligations \$10,000,000. Paid-in surplus \$10,066,074. Corporate surplus \$24,774. Earned surplus \$3,395,308.

**Rohr Aircraft Corp.**—In two months to Sept. 30 net profit \$20,074, or 2c each on 150,000 shares.

**Interstate Aircraft & Engineering Corp.**—For six months to Oct. 31 net income \$73,007, equal to \$1.22 each on 60,000 capital shares, against \$25,100 or 42c in 1940 period. Sales \$1,131,000 against \$350,323.

**Northrop Aircraft Inc.**—In two months to Oct. 31 net profit before Federal income taxes of \$44,300. Dividends totaled \$1,303,310, divided as follows: Aug. \$320,600; Sept. \$372,710 and Oct. \$610,475.

**Aircraft Accessories Corp.**—Showed net profit for four months to Aug. 31 of \$1,213; net sales were \$812,544.

Balance sheet as of Aug. 31: assets \$1,672,926; current assets \$827,368, including cash \$66,054; accounts receivable \$124,886; inventories \$603,562. Buildings and equipment \$804,558. Land \$30,116. Construction in progress \$32,839. Deferred development expenses \$70,859. Current liabilities \$712,137 including notes payable \$366,356; accounts payable \$282,678; accruals \$61,143. Preferred stock (37,010 shares) \$259,070. Common stock 50c-par \$60,608. Customers' advance deposits \$22,155. Paid-in surplus \$374,143. Deficit \$143,064.

PCA Purchase of 7 Lodestars  
Revealed in New SEC Report

PENNSYLVANIA - Central Airlines Corp. on Nov. 25 offered through underwriters 75,000 shares of \$1.25 cumulative convertible preferred stock at \$25 a share thus becoming the first transport company to seek new money in the public market in several months.

In the meantime, the company reported to Securities & Exchange Commission that its certificate of incorporation will be amended to authorize the preferred and 75,000 additional shares of common stock. There are presently authorized 500,000 capital shares which will be redesignated common stock of which 575,000 \$1-par shares will be authorized and 331,790 outstanding (150,000 of the common shares are reserved for conversion of the preferred; these shares are not included in the presently outstanding total).

The firm also reports an order dated Nov. 18 with Lockheed Aircraft Corp. for seven Lockheed Lodestars, Model 18-50, each equipped with two Wright GR-1820-G20A engines and a \$7,000 aggregate preliminary deposit on same.

Stockholdings of officers, directors, etc., as of Oct. 31 were reported as follows:

C. Bedell Monro, president, director, 300 shares capital stock, 4,627 stock

options; Frederick R. Crawford, executive vice-president and secretary, 90 stock options; R. G. Lochiel, treasurer, comptroller, 334 capital stock, 750 stock options, 100 warrants; K. H. Baile, director, 2,000 capital stock, 100 warrants; John W. Donaldson, director, 3,000 capital stock; Armand Erpf, director, 1,000 capital stock, 257 warrants; Lorenz Jensen, director, 8,000 capital stock; George T. Ladd, director, 2,276 capital stock, 21 warrants; John L. Loeb, director, 4,000 capital stock; G. Franklin Ludington, director, 100 capital stock; C. L. McCune, director, 1,185 capital stock, 47 warrants; Stanley C. Morris, director, 100 capital stock; Cohu & Torrey, 2,000 capital stock (additional 1,400 shares are owned of record, but not beneficially) 92 warrants; O'Brien, Mitchell & Co., 400 warrants; and Kay, Richards & Co., 200 capital stock.

Crawford, Ladd, Lochiel, Ludington, McCune, Monro and Wilson as stockholders of Pittsburgh Aviation Industries Corp. have an interest in an undetermined amount in 31,300 capital shares owned by that company, while 741 shares are held of record for account of customers of Kay, Richards & Co. and partners of that firm own beneficially 2,610 shares and warrants for 107 shares. Auchincloss, Parker & Redpath owned of record, but not beneficially 1,650 shares.

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# American Aviation

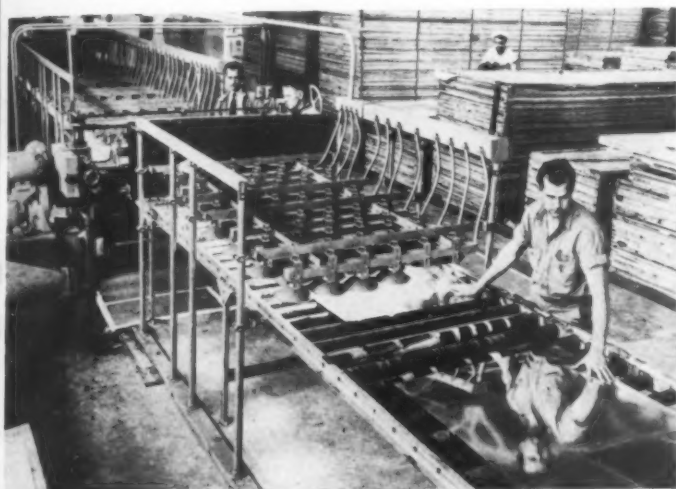
A Magazine  
Within a Magazine

DECEMBER 15, 1941

## EQUIPMENT NEWS

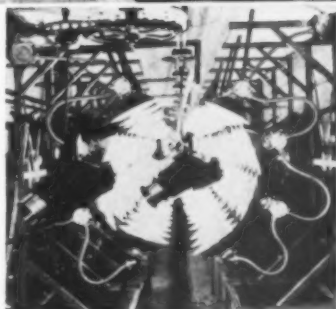
### Transport Operators Watch War-Time Research

#### Plane, Engine, Parts Manufacturers Using Infra-Red to Speed Production



OFFICIALS of firms in various branches of the industry, faced with speed-up and coordination problems, report successful application of the Fostoria Pressed Steel "Near Infra-red Process" in solving baking and finishing problems. Illustrations show treatment of aluminum sheet at Vultee Aircraft Inc., and of engine cylinders in the plant of Jacobs Aircraft Engine Co.

At Jacobs, various engine parts are now spray painted and run through a 21-foot Near Infra-red baking tunnel made up of 208 gold plated reflectors and 375-watt filament lamps. The conveyor moves at a variable speed of from one to three feet per minute, permitting visual inspection at any time, and completely dries parts in five minutes.



Courtesy of Fostoria Pressed Steel Corp.

Both Lockheed Aircraft Corp. and Vultee Aircraft use the Near Infra-red process to bake zinc chromate primer on aluminum sheets prior to forming. The sheet moves on flat conveyors under strips of gold-

(Turn to page 48)

#### Post-Crisis Airliners May Use Revolutionary Flying Wing Design, Davis Wing, Counter-Rotating Props

By E. J. FOLEY

**I**N THE FACE of pressure on the aircraft manufacturers and in consideration of the phenomenal expansion of facilities, it would be foolhardy for even an ouija-boarded visionary to attempt to foresee corporate names that will dominate the industry after the present emergency.

They may well be Ford, Chrysler and General Motors or again, Boeing, Lockheed, Douglas and Martin.

But whoever they may be, it is the consensus that their product on which they shall base their post-crisis production will be the commercial airliner, a far different airliner, no doubt, than we know today, but fundamentally involving the same detail design considerations to assure economical maintenance.

Today, we see research in the aircraft industry in high gear. All of its efforts are rightfully pointed in the direction of national defense and yet, incidentally, these invaluable contributions toward the solution of the many design and performance problems, offer much to the air transport operator in the future.

He is vitally interested in the solution of vapor-lock problems; which problems have been materially aggravated by the extreme high-altitude performance required of military craft and the solutions for which have been materially expedited as a result of this aggravation.

#### Interest in Vapor Lock

It may well be that vapor lock has been an unknown contributing

factor in many of his engine troubles and he is anxious to know the answers. Similarly, he wants to make future use of the immediately required innovations such as the "flying wing" design, the Davis wing, high power output engines, revolutionized propeller airfoil sections and even such features as counter-rotating propellers on a single shaft, etc.

All of these things will eventually represent desirable and necessary complements to the science of air transport operation. But if the gain to be so attained is to be net in its value, it will be obviously necessary that all of the little refinements unique to airline equipment be maintained and further developed, if not perfected.

If we're right in our feeling that the air transport craft will be the bread and butter of the manufacturer and that certain details of design concept must be incorporated in the airliner of the future, even to a more comprehensive degree than is at present practical, we think that a short resume of a few of those "things to think about" is not out of place at this time.

We don't mean to infer that any of our ideas are original or will revolutionize transport maintenance, nor do we mean to imply that most of the manufacturers are ignorant of them.

We offer them merely as reminders, mental prods, to the manufacturer in the hope that they will not be forgotten and completely divorced from airplane design and manufacture after the present defense efforts are relaxed.

Obviously, certain of these points  
(Turn to page 46)



## WE ARE PROUD TO SERVE IN THE BATTLE OF PRODUCTION!

Working closely with the production men of practically every aircraft manufacturer, Turco Service Engineers have learned the best ways to handle all types of industrial cleaning. These short cuts to efficient production are available to you.

### TURCO IS PROUD TO SERVE YOU PERSONALLY IN CONNECTION WITH THESE OPERATIONS:

ALUMINUM SPOT WELDING	ANODIZING
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MAINTENANCE AND OVERHAUL	MAGNESIUM PROCESSING
PHOSPHATIZING	PAINT DEPARTMENT MAINTENANCE
PAINT STRIPPING	PAINT CLEANING CAMOUFLAGE
ENGINE CLEANING	PLANT MAINTENANCE
WELDING FLUX REMOVAL	STAINLESS STEEL PROCESSING

AND IN ALL OTHER OPERATIONS INVOLVING ANY ASPECT OF CLEANING

WRITE and tell us which of the subjects above interest you and we'll send you some worth-your-time literature with no obligation on your part. With this increased knowledge, you can give your company top perfection in industrial cleaning—and have the personal satisfaction of knowing that the few extra minutes you take to study new, modern methods will be productive of time-saving, profitable results. SUGGESTION: Just write your name and address on the margin and check the operations in which you're interested. We'll do the rest!

## TURCO PRODUCTS, INC.

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## Many Advantages Claimed for New Type Aircraft Hose Clamp

A NEW TYPE aircraft hose clamp, introduced by Aircraft Components Inc., Van Nuys, Cal., exerts its tightening force around the entire circumference of the hose in much the same manner as a piece of cord is tightened around a parcel. A guide and trunnion assembly pulls up the clamp parallel to the axis of the hose rather than perpendicular to the axis as in conventional type clamps.

Designated the "King-Klump," the new device is a 360-degree clamp installed by wrapping it around the hose, pressing the facing bosses of the guide and trunnion assembly toward each other by hand, and tightening with a thumb screw. It can be installed with one hand in tight places, and because of its compactness can be used where there is not room for conventional type clamps.



Use of many anchor clips may be eliminated by replacing the thumb screw with a hexagonal nut, anchoring the hose clamp to a suitable fitting and securing it with an approved stop nut. Hose can be completely aligned for position before the clamp is installed.

The clamp is made of stainless steel, fabricated by spot welding. It remains fully tensioned under external or internal heat, and can be removed and re-used since it maintains a uniform bearing on the entire circumference of the hose without distortion or over-stressing. It is rust weather, and corrosion proof, and weighs one-third less than conventional clamps.

A one-third weight reduction, where a large number of clamps is used, makes an appreciable contribution to the current concerted design effort in this direction, in addition to the very desirable compactness, simplicity, and ease of installation and inspection found in the new "King-Klump."

James T. King, formerly superintendent of maintenance for Western Air Lines and more recently technical inspector with Cal-Aero Academy, is inventor of the clamp. Now on the technical staff of Aircraft Components, he has worked closely with the firm in final engineering and development work.

## Literature and Information

**HARDSTEEL DRILLS** for drilling and reaming hard metals. Methods for use and upkeep are described in booklet available from Black Drill Co., 5005 Euclid Ave., Cleveland, O.

**FRACTIONAL HORSEPOWER MOTORS** from 1/6 to 1/2 h.p. are described with charts and drawings in new 8-page folder, F-8623, put out by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

**WELDING PROCEDURES** is title of 54-page wire-bound book discussing different welding processes and their comparative application on various metals. Charts are included for keeping a cost record to obtain factual evidence of value of one process over another. Published by Air Reduction, 60 E. 42d St., New York, N. Y.

**FUNDAMENTALS OF STORAGE BATTERY CONSTRUCTION & OPERATION**, manual prepared by the B. F. Goodrich Co., Akron, O., is available in 14-page mimeographed form.

**OPERATION OF D-C MOTORS FROM A-C LINES** is described in 8-page booklet on "Thymotrol." G. E.'s electron tube motor control. Publication GED-972A, General Electric Co., Schenectady, N. Y.

**FLOODLIGHTING** for outdoor manufacturing areas and con-

### Engines Earn Their Keep

Pratt & Whitney aircraft engines to be built by Buick at its new Melrose Park, Ill., plant will earn part of their keep. Two-thirds of the power they will develop on test runs will be fed into power lines supplying the factory and will be used in making parts for more engines.

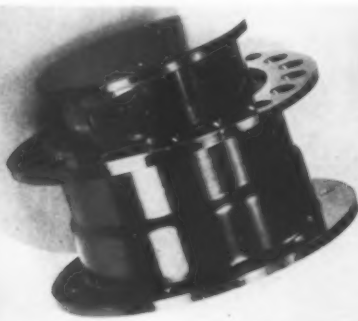
struction projects is covered in new 22-page bulletin B-2290 prepared by Westinghouse Electric & Mfg. Co., Cleveland, O.

**TRANSPARENT ENCLOSURES** problems in aviation—Plastic Department of E. I. du Pont de Nemours & Co., Arlington, N. J., has available to executives and engineers a booklet illustrating 10 uses of du Pont Lucite in aircraft transparent panels, windows and enclosures.

**SECOND '41 EDITION OF QUICK SELECTOR CATALOG**, prepared by Westinghouse, contains 60 pages of reference material on selection of electrical equipment for any motor, lighting, or feeder circuit. Copies available from department 7-N-20, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

**PUBLICATION GEA-3660** describes in detail the design, construction and application of the new General Electric 2300-volt contactor motor starter. Available from General Electric Co., Schenectady, N. Y.

## Aviation Items Among Plastic Prize Winners



Courtesy of "Modern Plastics" Magazine

RECOGNITION of the contribution of plastics to aviation was given recently by judges of the Sixth Annual Modern Plastics Competition, sponsored by *Modern Plastics* magazine. Top award in the transport classification went to the nose section (left, above) of the Canadian Avro Anson Bomber. The nose section, manufactured by Bristol Div. of Universal Moulded Products Corp., at Bristol, Va., under license agreement with Vidal Research Corp., is said to be the first application of plastic plywood as an integral part of a fighting plane's fuselage. Laminated mahogany veneers bonded with Plaskon provided the basic structure of the section. The forward dome-shaped window is made from Rohm & Haas Plexiglas, and the smaller windows of Monsanto Chemical Fibestos.

Top award in the military and defense classification went to the Glenn L. Martin Co. for its cabin ventilator made of Bakelite materials. The ventilator assembly (center illustration) may be opened and adjusted by

a simple operation to scoop air into or exhaust it from the cabin. In closed position the assembly is sealed tight and is completely flush with the outside contour of the aircraft. Molds for this production were supplied by the Richardson Co., Chicago, and the Fortney Mfg. Co., 247 N.J.R.R. Ave., Newark, N. J.

Washington Institute of Technology, 806 MacLachlen Bldg., Washington, D. C., received highest recognition in the scientific classification of the competition with a Radiosonde designed by B. Russell Shaw, vice-president of the Institute. Essential parts of the instrument (right) are made from Plaskon, an inert plastic material which is lighter than metal, is a non-conductor of heat or cold, and is unaffected by temperature changes. This particular radiosonde weighs less than a pound and a half and is about the size of an ordinary box camera.

## Magni-Ray Magnifies, Illuminates In Variety of Close Operations



prints, fine dials and graduations, maps and recording instruments.

The Magni-Ray is available in two types, with a 3" lens or a specially designed 2" wide achromatic lens with a magnification power of three plus. The manufacturer has just published a four-page bulletin describing and illustrating uses of the Magni-Ray. Available on request to the George Scherr Co., 128 Lafayette St., New York, N. Y.

## Safety Spectacles Prevent Eye Hazards

THE TULCA Division of the Univis Lens Co., Dayton, O., has added a new, rimless-type, safety spectacle to its eye protection line. The "Supervisor" spectacle is fitted with the company's special material (not glass) Tulca Safety Lenses. They come with or without side shields.

According to the manufacturer these safety spectacles are as comfortable and have the same appearance as regular eye-glasses because of the extremely light weight of the Tulca lenses. They were designed specifically for use by supervisors, checkers, inspectors, maintenance men, and by visitors who are exposed to eye hazards in plants, even though they are not actively engaged in operations where the wearing of goggles is mandatory. An important safety feature of these Tulca Lenses is the fact that they do not pit.

In addition to the Tulca "Supervisor" Safety Spectacles, the company also manufactures Tulca Safety Lenses for special types and sizes of safety goggles, as well as the Tulca GM No. 1 Safety Goggle.

## Westinghouse Develops New Indicating Lamp

FOR GENERAL indicating or signal purposes on switchboards, control desks, and panel boards, a new indicating lamp is announced by Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

Known as the Minalite, the lamp has a rectangular-shaped lens designed for extreme angular visibility. Receptacle is made of one-piece moulded material and is suitable for mounting on panels 1/16 to 2 inches thick. Resistors as part of the unit are used for line voltage ratings between 50 and 250 volts.

Pressure type leaf spring contacts establish connections with the slide base telephone lamp having a rating of .032-.038 amperes, 24 volts. The rectangular lens assembly is held in place by steel spring clips engaging in retaining grooves of the

receptacle. A chromium metal holder encases the lens and spring clips. Terminals of standard 10-32 hardware are easily accessible in the rear.

## First Aid Kit for Plants and Airports

E. D. BULLARD Co., 275 8th St., San Francisco, Cal., is marketing a completely weatherproof first aid kit usable at hangars, plants and outdoor stations.

It may be mounted to a wall or post and has special features which include a lid which opens to act as a shelf when the kit is in use, a rubber tube "weatherstrip" which also acts as a spring in opening the lid, and a mounting fastener which permits immediate removal for carrying.

Each kit is provided with an "Instant Guide to First Aid" giving application instructions and injury diagnosis symptoms.

## VIBRATION analysis steps-up production!

Solve your noise and vibration problems.

Electrical Research Products, working with the aviation industry, has developed special instruments to help

you speed up production of planes, engines and propellers.

We can undoubtedly save you time, trouble and money.

Write us today about your problems.

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76 Varick Street, New York, N. Y.

DIVISION OF

**Western Electric Company**

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## Air Associates Hydraulic Tester Saves Taking Equipment from Plane

A NEW PORTABLE hydraulic test unit is now available for checking, adjusting, and calibrating all types of conventional aircraft hydraulic equipment. It is unnecessary to remove equipment from the



plane, for this mobile test unit can be rolled directly to the airplane and tests conducted while the equipment remains on the ship. The type 810 Portable Hydraulic Test Stand is manufactured by Air Associates Inc., Bendix, N. J.

Contained in an enclosed cabinet provided with a control panel and mounted on molded rubber casters, the Air Associates Portable Test Stand can be moved easily from the

hangar to the ship. The portable test unit includes a complete motor driven hydraulic system and the required mechanisms for performing routine and service tests on landing gear retraction cylinders, flap cylinders, hand pumps, pressure relief valves, pressure control valves, check valves, windshield wipers, etc.

The cabinet contains a sink with a perforated top which drains directly into the fluid tank. This tank is mounted in the top of the motor compartment. Behind the sink is a sloping instrument panel on which is mounted the pressure gauge, the system cycling valve and the system shut-off valves, the push button starting switch, the handle for adjusting the relief setting of the pressure unloading valve, the handle of a by-pass valve and the filter-cleaning handle. Two 40" lengths of flexible high pressure hose lines are provided with adapters necessary to connect the hose to the standard fittings used in modern aircraft hydraulic accessories.

The cabinet is a plywood covered unit and the frame is made of welded angle iron. Hinged doors are provided to make the inside of the cabinet readily accessible. The sink and external fittings are of stainless steel and chromium plated metal.

## War-Time Research

(Continued from page 43)

are quite as applicable to military aircraft as to commercial but we feel their importance warrants the superficial inconsistency of presentation.

### Economy Is Important

The prime requisite is, naturally, economy of operation to assure profitable performance. Under this heading fall such automatic items as low specific fuel consumption engines, highly efficient propellers, high ratios of useful load to gross weight, efficient airfoil wing sections, etc. All of these factors are more fundamental than we care to discuss in this thesis. We have in mind those many little details of design and construction that facilitate maintenance.

The "quick-turn-around" is becoming more and more essential to successful air transport operation, because it represents the ultimate goal in the fight toward maximum utilization of aircraft. The results of a maintenance time reduction of two hours per day and the subsequent adding of this time to the air time of the airplane are self evident.

As an example, if we have an operator flying seven ships, seven hours a day, the above time saving would, in effect, increase his fleet to nine aircraft, assuming the same seven hours operation for each.

Interchangeability of at least major components, between aircraft, is one of the most important factors in airline equipment design

and production. The automobile manufacturer, because of his extensive mass production experience should be able to contribute much to this cause. By major component, we mean such units as nacelles, ailerons, flaps, rudders, etc. The time-waste where it is necessary to match certain of these assemblies to certain aircraft only, is tremendous; utility of all spare parts is restricted and it may even be necessary to introduce complicated identification schemes whereby certain units are specified as usable only on NC-10000.

Naturally, the operator can, in many instances correct this situation, by reworking all attachments on all ships, all operating components and all spare components, but this should not be necessary. Aircraft manufacturing techniques which will assure the elimination of any individuality from "identical" parts is the answer.

### Minimization of 'Blinds'

Equally necessary to simplified maintenance is the minimization of structural "blinds," those spots which by virtue of their position, defy maintenance and invite corrosion with attendant failure. Examples of these blinds are rivet heads covered by gussets, low points in fuel or water tanks not equipped with drains, etc.

This minimization can only be assured by an alertness on the part of the designer and manufacturer to the maintenance problems which

## Westinghouse Plants Salvage 60 Tons of Aluminum Monthly

ALUMINUM enough to build 10 Army bombers, 120,000 pounds of it, is reclaimed every 30 days by the reclamation division of Westinghouse Electric & Mfg. Co. According to W. J. Laird, head of the division at the Linehart Works, about 1,180,000 pounds of non-ferrous metals, including copper base and aluminum base alloys, were reclaimed last month from Westinghouse plants around Pittsburgh, at South Philadelphia and Sharon, Pa., and at Jersey City.

Machine shop remnants, after pure aluminum and copper are removed, are divided into about 50 alloy categories. Placed in a revolving bucket, a batch is thoroughly mixed and tested to determine type and quantity of metals it contains. Various amounts of pure metals are added to get the right content for a specific alloy. In gas furnaces, resembling huge tea kettles and fired at temperatures between 1800 and 2300 degrees F., as much as 20,000 pounds of scrap at one time can be melted down and poured into 100-pound ingots.

Tested again by chemical analysis, the ingots are given identification numbers and held at the Linehart Works for making various types of castings, or shipped to other Westinghouse plants for re-use in production.

each part of the whole aircraft will present. It should be borne in mind that certain "extravagances" in manufacturing to avoid such inaccessible details are in the long run, operating economies.

While on this subject, we might simply comment on the requirement for plenty of inspection panels and covers, readily removable to permit the determination of a need for maintenance before the entire unit is disassembled.

A mere mention of stringent weight control and mutual efforts toward reduction by all parties concerned will suffice.

The feature of nacelle accessibility can be argued pro and con. The use of this convenience which permits crew members to inspect or maintain certain rear-section accessories and fittings, even in flight, is only feasible in aircraft appreciably larger than those now in service on the domestic airlines.

However, it has been indicated that the availability of this feature, where possible and consistent with design considerations, can result in a reduction of schedule delays and maintenance returns and also contributes toward an improved crew morale. This innovation is highly specialized in nature and scope and its importance can best be evaluated by the operator concerned.

### Adequate Power Necessary

There are several factors that must be borne in mind relative to the complicated electrical systems that must be provided in passenger-carrying aircraft. You're almost duplicating a house electrical system on a low-voltage basis and it further seems that many, almost all, of the new gadgets for installation in airliners require electric power for their operation. If it isn't a cabin heat control, it's a source of supply for the electric shavers. Therefore, we should mention the need for ample and super-adequate power supply, plenty of margin in conduit wire-carrying capacity, reasonable practice in fusing and fuse locations and wire sizes appropriate to the anticipated requirements.

To hold maintenance to a minimum, circuits should be broken at

convenient points with some of multiple connector, so that won't be necessary to pull wires to 30 or 40 feet in length with attendant hazards of breaking conductor, etc.

Regarding the "ample and super-adequate power supply" mentioned above, it doesn't seem out of line to propose the possible utilization of auxiliary powerplants, possibly higher voltages to handle some of the load, either directly or by step down. With galley equipment for keeping foods hot and cold, coming more and more into the picture, electric ice boxes and stoves may be right around the corner.

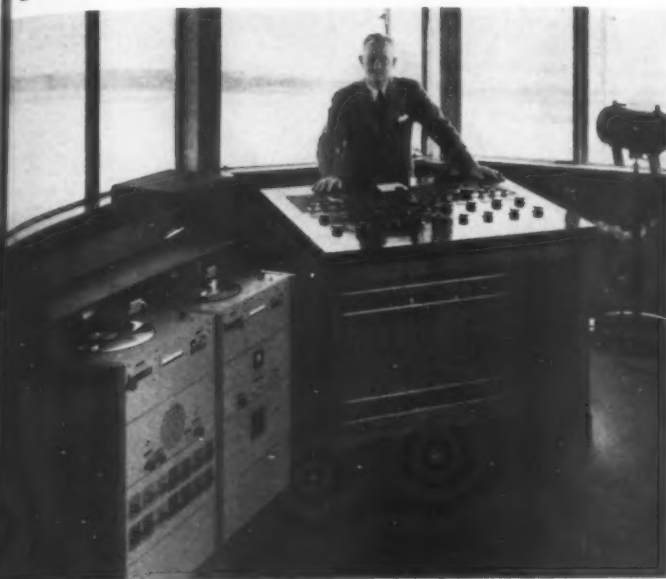
### Instrument Assemblies

The installation and lighting of instrument assemblies and panels is a subject that is receiving much attention in military aircraft now and has an equal or even greater role in transport planes. To reduce pilot fatigue, at the same time holding maintenance complications to a low point is the ultimate in desirability. It is generally admitted that the instrument design possible can be entirely voided by improper installation. Reflection elimination through proper location of the instrument, regardless of type of light source, will contribute toward more successful operation.

The utilization of such features as pressure, suction, electrical and hydraulic fluid manifolds, which centralize the points of connection together with quick-disconnect type fasteners on the entire panel would do much to reduce maintenance and record.

Finally, we might comment briefly on the manufacturer's responsibility by Rite to provide adequate, detailed, illustrative written matter relative to maintenance of the aircraft. It is natural and expected that a certain amount of advertising should enter into such publications, but the need for the concrete data cannot be eclipsed by publicity factors. Descriptive material regarding all of the several systems on the airplane, together with the manufacturer's recommended procedure for maintenance and repair, of at least those parts which he manufactures, is an integral part of the airplane.

## Recordings of All Control Tower Operations Now Available at SF



A DIRECT, permanent sound record of all operations of the control tower of the San Francisco Airport has recently been made possible through the installation of continuous recording equipment by Frank Rieber Inc., manufacturing engineers of Los Angeles.

The installation consists of two CGS (constant groove speed) Recorder and Playback units, each capable of recording 62 minutes of sound on each side of a 12-inch plastic disc.

The equipment may be clock-operated, carrier-operated, manually-operated, or by transmitter only. When clock operated, there is a 2-minute overlap at the time of change from one instrument to the other, in order to guard against any possibility of omission. In the carrier operation the recorder is idle until a signal comes in through one of the receivers, when it starts automatically.

The CGS equipment is a 14-channel installation, sufficient to take care of 13 receivers and the transmitter, although at present only six loudspeakers are being employed.

The recorders are equipped for simultaneous playback. Thus an operator may immediately playback an indistinctly heard incoming signal without affecting the continuous recording of incoming messages.

A "squench panel," also provided by Rieber engineers, is hooked up with all 14 channels to eliminate relative static during idle periods.

Each plastic disc carries a label on which is written the date, hour and minutes, operator's name, and other information required by the FCC of all radio transmissions, and for quick and easy reference. The discs may be filed more than 40 to the inch in an ordinary filing cabinet. In sizeable operations like the 20-hour routine at the San Francisco Airport, this economy of filing space becomes important.

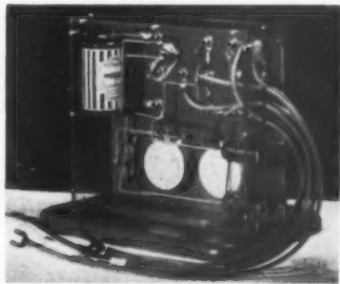
The San Francisco installation was made under the direction of B. M. Doolin, manager of the air-

port department of the City of San Francisco, who is shown here behind the SF control panel with the recording installation at the left.

The basic CGS equipment in the San Francisco installation is exactly like the CGS P-2 portable type, which is now being widely used by schools, law enforcement agencies and industrial organizations, particularly defense industries.

## Test Box Devised for Electrical Instruments

STUDENTS in the instrument shop at Boeing School of Aeronautics, Oakland, Cal., have developed a portable test box to be used in conjunction with a master millivoltmeter and a variable resistance box.



Designed for checking voltmeters, millivoltmeters, cylinderhead gauges, electric oil temperature gauges, electric tachometers, tachometer magnetos, and the school's special oil temperature gauges, the test box consists of a 6" x 7" panel enclosed in pyralin to permit students to trace the circuit of the box visually.

The new device weighs less than three pounds and can be set up in any part of the shop to act as a clearing house between current supply, master indicator, and the instrument to be tested. Development work was under Ray Stephan of the Boeing faculty.

## Importance of Welding Symbolized by Stamp

THE TREMENDOUS part arc welding is playing in the war effort of the Union of South Africa has been recognized by the issuance of a special postage stamp. This indicates that the Union is not lagging behind other countries in the use of this new industrial giant in the construction of her ships, tanks, aircraft and similar equipment.

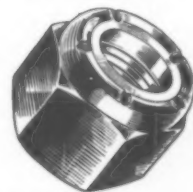


The photographs, supplied by Lincoln Electric Co., Cleveland, show two of the stamps which are of 6d value. Each stamp is printed both in English, as shown on the right, or Afrikaans, as on the left. This is the case with all stamps issued in South Africa.

The stamp depicts a welder using modern shielded electric arc equipment and dressed in protective head shield, gloves and other special clothing.

Lincoln Electric officials say that as far as they know, this is the first time that such a stamp has been issued in the history of either stamps or welding.

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### Small Device Produces Complete Soldering Job

A NEW product, known as "Jiggers" and manufactured by Jiggers Inc., 215 W. Illinois St., Chicago, is available to electricians, electrical service and maintenance men, and manufacturers of electrical products.



Each Jigger is a small, self-contained soldering unit containing 50-50 solder and flux hermetically sealed within a waterproof heat-generating outer shell.

As shown in the illustration, touching a match to the Jigger ignites the shell and produces proper temperature to flow the solder into the splice. The burnt shell is then dropped off, leaving a smoothly soldered splice.

### A Problem for Ickes

A total of 955 gallons of gasoline will be consumed in testing each Buick-built Pratt & Whitney aircraft engine before delivery to the Air Corps.

### Wittek Hose Clamp for Aircraft Use

DESIGNED and tested for aircraft use, this Wittek Type FB Hose Clamp is a solid band clamp of stainless steel, welded with four spots at the nut. It has a floating bridge to eliminate friction; strain and buckling of the hose, and to permit use of a torque indicating wrench so that all clamps can be tightened uniformly.



The end of the 1/4-28 thumb-screw is riveted to the bridge to permit the bridge to retract as the screw is loosened, letting the clamp return to original size for re-use. The thumbscrew head is punched for tie wire.

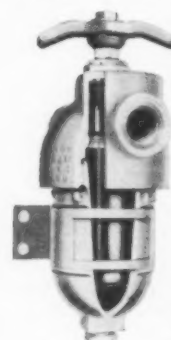
Manufacturer is Wittek Mfg. Co., 4305 W. 24th Place, Chicago, Ill.

### Mask Affords Protection When Handling Acids

A HOOD and mask provided with shatter-proof full vision goggles has been developed for workers handling strong acids. Known as the Bullard Acid Mask and manufactured by E. D. Bullard Co., 275 8th St., San Francisco, Cal., it is made of impregnated cloth which is double stitched and cemented at the seams.

The live rubber goggle mounting has inbuilt indirect air vents against splattering liquids, but preventing fogging under normal working conditions.

### Aero Oil Filter Weighs Only Pound-and-a-half



In service sixteen years, the Aero Oil Filter is used in tractors, tanks, turrets, and other hydraulically controlled machinery. The manufacturer, Purolator Products Inc., 365 Freylinghuysen Newark, N. J., designates the filter as Purolator G-159-J3. Weighing only 1 1/2 pounds, operating pressures for the filter are from 100 to 1500 P.S.I., and bursting pressure is 4170 P.S.I. and above.

### Stubby Box Wrench Developed by Plomb

A USEFUL set of short 12-point offset box wrenches has been developed by Plomb Tool Co., 230 Santa Fe Ave., Los Angeles, Cal.

The stubby wrench has an offset clearance of 9/16" and an overall length of 5" to 6 1/2". It is made for tight assembly and maintenance work and is sufficiently compact that it can be used with speed and safety, holding the work almost entirely within the hand.

The wrenches are full plated steel with polished heads. While available as a set (#8100A) in a canvas bag, they may be obtained singly with the following openings: #8100-3/8 x 7/16; #8161-1/2 x 9/16; #8162-5/8 x 1 1/16; and #8163-3/4 x 1 3/16.

### Infra-Red

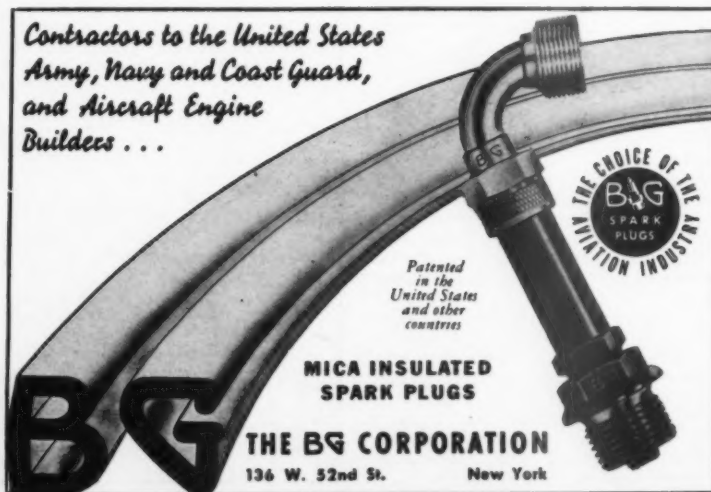
(Continued from page 43)

plated reflectors, baking the film in upward of 30 seconds depending on gauge of the metal.

Triplet Electrical Instrument Co., Bluffton, O., the Naval Air Base at San Diego, Cal., Norge Heating & Conditioning Co., Detroit, Mich., and Bendix Aviation Corp., South Bend, Ind., are all using various applications of the process to speed finishing of parts for the aircraft industry. At the Fostoria, Ohio, plant of Fostoria Pressed Steel Co., manufacturers of the Near Infra-red process, non-magnetic Local lighting units are being finished for use on Lockheed, Douglas, Vultee, Martin and Consolidated combat planes.

Users of the process have found that in addition to speed, the Near Infra-red process offers such advantages as decreased spoilage, freedom from hazard, lower equipment investment, no stand-by loss of heat, utilization of waste space, freedom from excessive heat around equipment, and flexibility of equipment.

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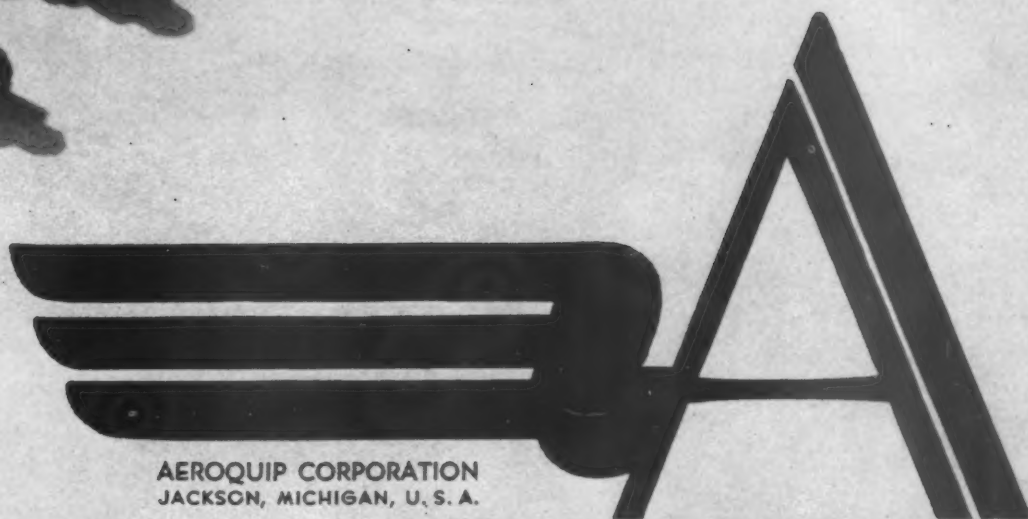
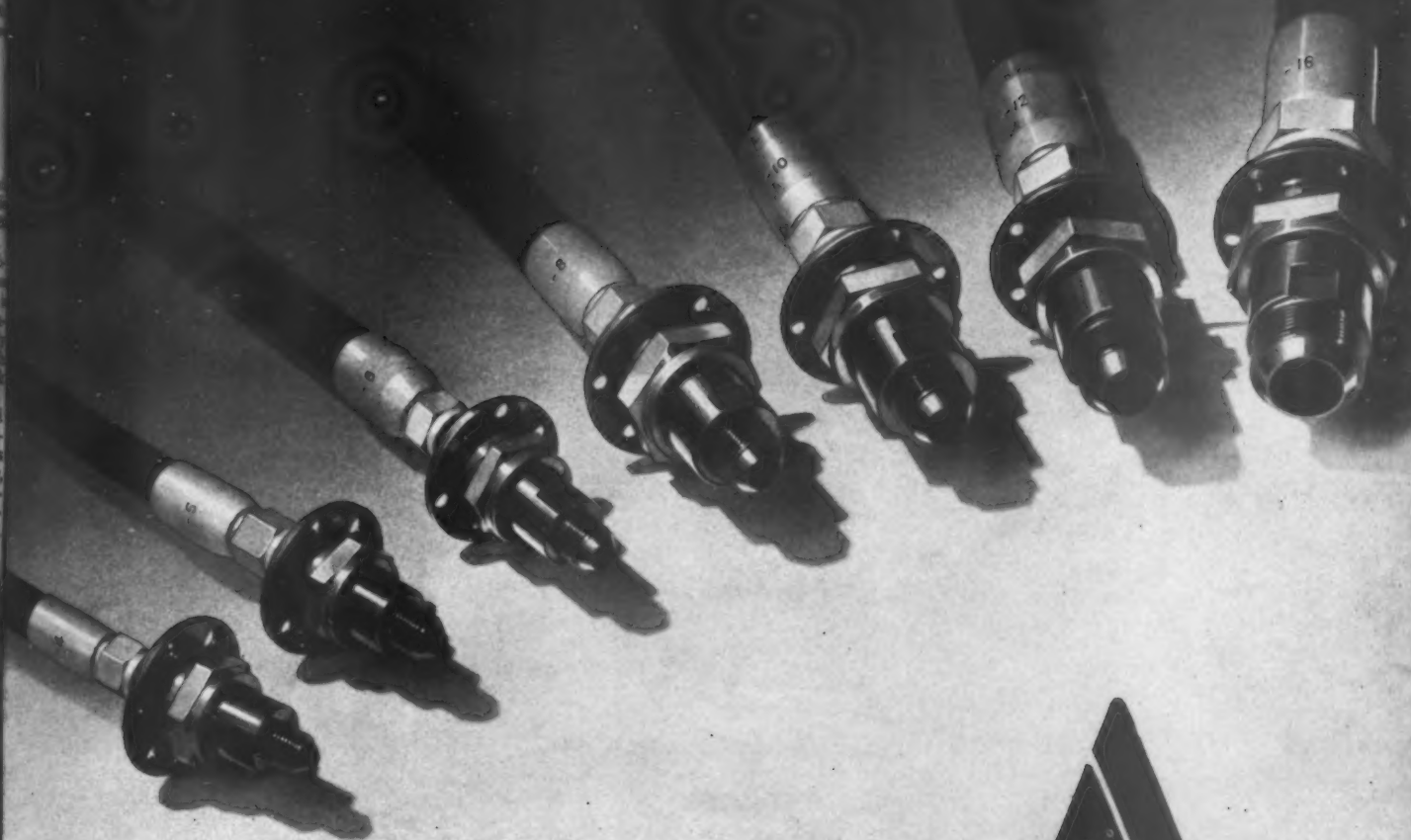
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